TLM 2000B - Decom Health & Safety/Standby Telemetry

Test Case No.: TLM 2000B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display pages Header and TLM-2000B. Health & Safety and Standby telemetry mnemonics defined in the I&T database with offsets matching those output by the telemetry data driver. A predefined procedure is used by the Telemetry packet generator to input raw values for each telemetry mnemonic.

Test Case Description: This test is designed to verify the ability to receive spacecraft/instrument Health & Safety and Standby CTIU EDOS Data Units (EDUs), extract CCSDS telemetry packets from the EDUs, extract all header information, extract the telemetry information from the packet application data field, and decommutate the data based on the packet APID and associated decommutation information residing in the PDB.

Following sign-on, alphanumeric telemetry pages which include parameter and associated parameter Decom value displays are invoked at the user station. The telemetry data driver is initiated, broadcasting Health & Safety telemetry onto the FOS LAN in the form of EDUs. As telemetry packets are received and the telemetry information decommutated, telemetry displays are viewed and snapped at specified times. Raw parameter values residing on alphanumeric displays are analyzed post-test to ensure decommutated values match scripted raw values for specified mnemonics. The above steps are repeated for Standby CTIU telemetry processing.

Success Criteria: This test is considered successful when all Health & Safety/Standby telemetry header and data mnemonics are decommutated as specified and match data driven values; values as seen on multiple user stations match data driven values; static and NODATA flags are disabled from alphanumeric telemetry displays upon active data periods.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	

2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the "Control window" is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	Connect to a real-time operational string, to accept Health & Safety data, by entering the following in the ECL directive line of the Control window: ECL>**STRING CONNECT STRING=100 CONFIG= MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

| 8. | At the user station, display the EDU Header alphanumeric page which displays telemetry header field values by entering the following in the ECL directive line of the Control window:

ECL> **PAGE Header** | Verify the Header window appears at the user station and contains the following fields:

- Static flags for all descriptors

-Spacecraft time (SDU_SCTIME)

-Data source (spacecraft ID) (EDS_SCID)

-Quality indicator (EDS_QUALITY)

-APID number (SDU_PCKT_APID)

-Packet sequence count SDU_PACKET_SEQ)

-Header ID (SDU_SEC_HEADER)

-Packet length count (SDU_PCKT_LENGTH)

-Mstr. Cycle Count (EDS_CYCLE_COUNT)

-Header Length (EDS_CCSDS_HDR_LENGTH)

-CCSDC Version (SDU_CCSDS_VER) | |

| 9. | At the user station, display the "TLM2000B" alphanumeric page, which displays Health & Safety, Standby mnemonic values, by entering the following in the ECL directive line of the Control window:

ECL> **PAGE TLM2000B** | Verify the "TLM2000B" alphanumeric display appears at the user station and contains the following:

Health & Safety Mnemonics:

-SMS_SR_HGA_DS_POTA

-SMS_SR_HGA_DS_POTB

-GNC_SR_SHDPA_TACH_3M

-CDH_NR_SSR2_HKRECTR

-GNC_SR_ACEB_PITCHSEL

-MOD_CR_CPB_EEP_WRE_S

-GNC_BR_ACEA_CSM_TMR

Standby Mnemonics:

-CDH_NR_ACT_NXT_FRSEQ

-CDH_NR_ACT_PN_MC

-CDH_NR_ACT_B_FRONT

-CDH_CR_ACT_RPT_TYP

-CDH_BR_SCC2_VALDAT

-CDH_SR_ACT_UL_INBUFF

-CDH_BR_MODBDU_VALDAT

"STATIC" flags should be present for all descriptors. | |

10.	Move the cursor over the "Header" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
13.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
16.	Move the cursor over the "TLM2000B" alphanumeric page and repeat steps 11-15.	The "Data Source Selector" window will disappear.	
17.	Invoke the EDOS telemetry driver for the multicast of Health & Safety telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgPackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

| 18. | Start the pre-defined procedure (used by the packet generator to assign values) by typing the following in the ECL directive line of the Control window:

ECL>**START TLM2000B** | An event message stating that the procedure controller is starting TLM2000B appears in the Event Display window.

The values assigned to each mnemonic will appear in the terminal window in which the telemetry driver was started.

An event message stating that the Procedure Controller is finished processing TLM2000B appears in the Event Display window. | |

19.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20002 APID=2** ECL>**PG STARTDATA APID=2 COUNT=-1**	Verify (after one master cycle) that each mnemonic's: -SMS_SR_HGA_DS_POTA -SMS_SR_HGA_DS_POTB -GNC_SR_SHDPA_TACH_3M -CDH_NR_SSR2_HKRECTR -GNC_SR_ACEB_PITCHSEL -MOD_CR_CPB_EEP_WRE_S -GNC_BR_ACEA_CSM_TMR "STATIC" or "NODATA" flag indicators no longer appear on the display page and that the mnemonics listed above are marked as active. Verify that mnemonics that are not defined as Health & Safety mnemonics are still flagged as "STATIC" or the "NODATA" indicators are still apparent.	
20.	View the Header page and when packet 4 is sent, snap the telemetry pages "TLM2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

21.	View the Header page and when packet 12 is sent, snap the telemetry pages "TLM2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
22.	View the header page and when packet 20 is sent, snap the telemetry pages "TLM-2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
23.	View the Header page and when packet 28 is sent, snap the telemetry pages "TLM2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
24.	Stop the telemetry drivers by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=2**	Telemetry stops flowing. Event message appears in terminal window of telemetry driver stating that data has stopped. All mnemonics on telemetry pages "TLM2000B" and "Header" are marked as static.	

25.	Via offline analysis, verify that the Health & Safety mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCSDS_VER, and SDU_PACKET_SEQ as shown on screen snaps of the user station match values specified in Table TLM2000B-1.	The Health & Safety mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2000B-1.	
26.	Via offline analysis, verify that the Health & Safety telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2000B-1.	The Health & Safety telemetry mnemonics, as shown on screen snaps of the user station, will match values specified in Table TLM2000B-1.	
27.	Move the cursor over the "Header" alphanumeric page.		
28.	Click the mouse on the right button.		
29.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
30.	Click the mouse on the "Refresh" button.	The message "Data Source Refreshed" will appear in the status box.	
31.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
32.	Move the cursor over the "TLM2000B" alphanumeric page and repeat steps 28-31.	The "Data Source Selector" window will disappear.	

33.	To start the telemetry driver, enter the following in the ECL directive line of the Control window:
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20004 APID=5**
	
	    ECL>**PG STARTDATA APID=5 COUNT=-1**
		Verify (after one master cycle) that each mnemonic's:
		
		-CDH_NR_ACT_NXT_FRSEQ
		
		-CDH_NR_ACT_PN_MC
		
		-CDH_NR_ACT_B_FRONT
		
		-CDH_CR_ACT_RPT_TYP
		
		-CDH_BR_SCC2_VALDAT
		
		-CDH_SR_ACT_UL_INBUFF
		
		-CDH_BR_MODBDU_VALDAT
		
		"STATIC" or "NODATA" flag indicators no longer appear on the display page and that the mnemonics listed above are marked as active.
		
		Verify that mnemonics that are not defined as Standby mnemonics are still flagged as "STATIC" or the "NODATA" indicators are still apparent.	

34.	View the Header page and when packet 7 is sent, snap the telemetry pages "TLM2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

35.	View the Header page and when packet 15 is sent snap the telemetry pages "TLM2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
36.	View the Header page and when packet 22 is sent, snap the telemetry pages "TLM2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
37.	View the Header page and when packet 30 is sent, snap the telemetry pages "TLM2000B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
38.	Stop the telemetry drivers by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=5**	Telemetry stops flowing. Event message appears in terminal window of telemetry driver stating that data has stopped. All mnemonics on telemetry pages "TLM2000B" and "Header" are marked as static.	

39.	Via offline analysis, verify that the Standby mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCSDS_VER, and SDU_PACKET_SEQ, as shown on screen snaps of the user station, match values specified in Table TLM2000B-2.	The Standby mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2000B-2.	
40.	Verify that the Standby telemetry mnemonics, as shown on screen snaps for the user station, match values specified in Table TLM2000B-2.	The Standby telemetry mnemonics, as shown on screen snaps of the user station, will match values specified in Table TLM2000B-2.	
41.	Log off the user station(s).		
42.	End of test.		

Table 5-2. TLM2000B-1

	H & S tlm PKT 4	H & S tlm PKT 12	H & S tlm PKT 20	H & S tlm PKT 28
SDU_SCTIME	sequential	sequential	sequential	sequential
EDS_SCID	42	42	42	42
EDS_QUALITY	0	0	0	0
SDU_PCKT_APID	2	2	2	2
SDU_PCKT_LENGTH	202	202	202	202
SDU_PCKT_SEQ	36	44	52	60
SDU_CCSDS_VER	0	0	0	0
SMS_SR_HGA_DS_POTA	4	12	20	28
SMS_SR_HGA_DS_POTB	0	2	3	1
GNC_SR_SHDPA_TACH_3M	1	4	5	3
CDH_NR_SSR2_HKRECTR	0	3	4	2
GNC_SR_ACEB_PITCHSEL	R_IRU1_P_ESA2	R_IRU1_P_ESA1	R_IRU2_P_CSS2	R_IRU2_P_CSS1
MOD_CR_CPB_EEP_WRE_S	ENABLED	DISABLED	DISABLED	ENABLED
GNC_BR_ACEA_CSM_TMR	NO_TIME_OUT	TIME_OUT	TIME_OUT	NO_TIME_OUT

Table 5-3. TLM2000B-2

	Standby tlm PKT 7	Standby tlm PKT 15	Standby tlm PKT 22	Standby tlm PKT 30
SDU_SCTIME	sequential	sequential	sequential	sequential
EDS_SCID	42	42	42	42
EDS_QUALITY	0	0	0	0
SDU_PCKT_APID	5	5	5	5
SDU_PCKT_LENGTH	202	202	202	202
SDU_PCKT_SEQ	39	47	54	62
SDU_CCSDS_VER	0	0	0	0
CDH_NR_ACT_NXT_FRSEQ	4	12	20	28
CDH_NR_ACT_PN_MC	3	6	10	5
CDH_NR_ACT_B_FRONT	5	10	6	4
CDH_CR_ACT_RPT_TYP	1	3	5	7
CDH_BR_SCC2_VALDAT	NOT VALID	VALID	NOT VALID	VALID
CDH_SR_ACT_UL_INBUFF	FULL	NOT FULL	FULL	NOT FULL
CDH_BR_MODBDU_VALDAT	VALID	NOT VALID	VALID	NOT VALID

TLM-2010B Decom - Housekeeping Telemetry

Test Case No.: TLM 2010B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display pages "Header" and "TLM-2010B". Housekeeping telemetry mnemonics defined in the I&T database with offsets matching those output by the telemetry data driver. A predefined procedure is used by the Telemetry packet generator to input raw values for each mnemonic.

Test Case Description: This test is designed to verify the ability to receive spacecraft/instrument Housekeeping Data Units (EDUs), extract CCSDS telemetry packets from the EDUs, extract all header information, extract the telemetry information from the packet application data field, and decommutate the data based on the packet APID and associated decommutation information residing in the PDB.

Following sign-on, alphanumeric telemetry pages which include parameter and associated parameter Decom value displays are invoked at the user station. The telemetry data driver is initiated, broadcasting Houskeeping telemetry onto the FOS LAN in the form of EDUs. As telemetry packets are received and the telemetry information decommutated, telemetry displays are viewed and snapped at specified times. Raw parameter values residing on alphanumeric displays are analyzed post-test to ensure decommutated values match scripted raw values for specified mnemonics.

Success Criteria: This test is considered successful when all Houskeeping telemetry header and data mnemonics are decommutated as specified and match data driven values; values as seen on multiple user stations match data driven values; static and NODATA flags are disabled from alphanumeric telemetry displays upon active data periods.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	

2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	Connect to a real-time operational string, to accept Housekeeping data, by entering the following in the ECL directive line of the Control window: ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

| 8. | At the user station, display the EDU "Header" alphanumeric page which displays telemetry header field values by entering the following in the ECL directive line of the Control window:

ECL> **PAGE Header** | Verify the Header window appears at the user station and contains the following fields:

-Static flags for all descriptors

-Spacecraft time (SDU_SCTIME)

-Data source (spacecraft ID) (EDS_SCID)

-Quality indicator (EDS_QUALITY)

-APID number (SDU_PCKT_APID)

-Packet sequence count SDU_PACKET_SEQ)

-Header ID (SDU_SEC_HEADER)

-Packet length count (SDU_PCKT_LENGTH)

-Mstr. Cycle Count (EDS_CYCLE_COUNT)

-Header Length (EDS_CCSDS_HDR_LENGTH)

-CCSDC Version (SDU_CCSDS_VER)

"STATIC" flags should be present for all descriptors. | |

| 9. | At the user station, display the "TLM2010B" alphanumeric page, which displays Housekeeping mnemonic values, by entering the following in the ECL directive line of the Control window:

ECL> **PAGE TLM2010B** | Verify the "TLM2010B" display appears at the user station and contains the following:

Housekeeping Data:

-CDH_NR_ACT_NXT_FRSEQ

-FS2_SS_MSMT_UP_CNT

-EPS_TR_SAA_MST_MTRA

-FS1_SS_IACSPW_1

-CDH_BR_SSR1_SCRPLY

-GNC_BR_ANG_MODE_2

-COM_BR_SBT2_PN_LOCK

-CDH_SR_SCT_OP_STATE

CERES Data:

-CEA_NS_PKTCOUNT

-CEA_NS_PKTTIME_1

-CEA_NS_PKTTIME_2

-CEA_CS_SWSTPTT

-CEA_NS_AZSTCNT

-CEA_BS_SOLWARN

-CEA_BS_MAMACTS

"STATIC" flags should be present for all descriptors. | |

10.	Move the cursor over the "Header" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
13.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
16.	Move the cursor over the "TLM2010B" alphanumeric page and repeat steps 11-15.	The "Data Source Selector" window will disappear.	
17.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing on the I channel. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgPackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

18.	Start the pre-defined procedure (used by the packet generator to assign raw values to each telemetry mnemonic) by typing the following in the ECL directive line of the Control window: ECL> **START TLM2010B**	An event message stating that the procedure controller is starting TLM2010B appears in the Event Display window. The values assigned to each mnemonic will appear in the terminal window in which the telemetry driver was started. An event message stating that the Procedure Controller is finished processing TLM2010B appears in the Event Display window.	

19.	To start the telemetry driver, enter the following in the ECL directive line of the Control window:
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20001 APID=1**
	
	    ECL>**PG STARTDATA APID=1 COUNT=-1**
		Verify (after one master cycle) that each mnemonic's "STATIC" flag indicators no longer appear on the display pages and that the mnemonics are marked as active.	

20.	View the Header page and when packet 7 is sent, snap the telemetry pages "TLM2010B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
21.	View the Header page and when packet 15 is sent, snap the telemetry pages "TLM2010B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

22.	View the Header page and when packet 23 is sent, snap the telemetry pages "TLM2010B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
23.	View the Header page and when packet 31 is sent, snap the telemetry pages "TLM2010B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
24.	View the Header page and when packet 39 is sent, snap the telemetry pages "TLM2010B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
25.	View the Header page and when packet 47 is sent, snap the telemetry pages "TLM2010B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
26.	View the Header page and when packet 55 is sent, snap the telemetry pages "TLM2010B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

27.	Stop the telemetry drivers by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=1**	Telemetry stops flowing. Event message appears in terminal window of telemetry driver stating that data has stopped. All mnemonics on telemetry pages "TLM2010B" and "Header" are marked as static.	
28.	Via offline analysis, verify that mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCSDS_VER, and SDU_PACKET_SEQ as shown on screen snaps of the user station match values specified in Table TLM2010B-1.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2010B-1.	
29.	Via offline analysis, verify that the Housekeeping telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2010B-1.	The Housekeeping telemetry mnemonics, as shown on screen snaps of the user station, will match values specified in Table TLM2010B-1.	
30.	Log off the user station(s).		
31.	End of test.		

Table 5-4. TLM2010B-1 (1 of 2)

	HK tlm PKT 7	HK tlm PKT 15	HK tlm PKT 23	HK tlm PKT 31	HK tlm PKT 39	HK tlm PKT 47	HK tlm PKT 55
SDU_SCTIME	sequential	sequential	sequential	sequential	sequential	sequential	sequential
EDS_SCID	42	42	42	42	42	42	42
EDS_QUALITY	0	0	0	0	0	0	0
SDU_PCKT_APID	1	1	1	1	1	1	1
SDU_PCKT_LENGTH	1658	1658	1658	1658	1658	1658	1658
SDU_PCKT_SEQ	71	79	87	95	103	111	119
SDU_CCSDS_VER	0	0	0	0	0	0	0
CDH_NR_ACT_NXT_FRSEQ	7	15	23	31	39	47	55
FS2_SS_MSMT_UP_CNT	0	1	1	2	2	3	3
EPS_TR_SAA_MST_MTRA	15	5	20	10	7	14	10
FS1_SS_IACSPW_1	7	6	14	25	8	11	14
CDH_BR_SSR1_SCRPLY	OFF	SCI_REPLAY	OFF	SCI_REPLAY	OFF	SCI_REPLAY	OFF
GNC_BR_ANG_MODE_2	NORMAL_ANGLE	NORMAL_ANGLE	WIDE_ANGLE	NORMAL_ANGLE	WIDE_ANGLE	WIDE_ANGLE	NORMAL_ANGLE
COM_BR_SBT2_PN_LOCK	Locked	Locked	Not_Locked	Locked	Not_Locked	Locked	Not_Locked
CDH_SR_SCT_OP_STATE	STANDBY	STANDBY	ACTIVE	ACTIVE	STANDBY	ACTIVE	ACTIVE

Table 5-4. TLM2010B-1 (2 of 2)

	CR tlm PKT 7	CR tlm PKT 15	CR tlm PKT 23	CR tlm PKT 31	CR tlm PKT 39	CR tlm PKT 47	CR tlm PKT 55
CEA_NS_PKTCOUNT	2	4	6	8	10	12	14
CEA_NS_PKTTIME_1	Sequential	Sequential	Sequential	Sequential	Sequential	Sequential	Sequential
CEA_NS_PKTTIME_2	Sequential	Sequential	Sequential	Sequential	Sequential	Sequential	Sequential
CEA_CS_SWSTPTT	6	9	3	1	4	5	7
CEA_NS_AZSTCNT	1	3	5	7	9	11	13
CEA_BS_SOLWARN	NORMAL	NORMAL	WARNING	WARNING	NORMAL	WARNING	NORMAL
CEA_BS_MAMACTS	SENSOR_1	SENSOR_1	SENSOR_1	SENSOR_2	SENSOR_2	SENSOR_2	SENSOR_1

TLM-2020B Decom - Context Dependent Telemetry

Test Case No.: TLM 2020B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display page "Context", which includes all test and context key mnemonics. Housekeeping telemetry mnemonics defined in the I&T database with offsets matching those output by the telemetry data driver; test mnemonic TBS(1) contains 16 pre-defined switch ranges based on its key mnemonic TBS(2). Test mnemonic TBS(3) contains switch ranges based on a derived mnemonic (TBS(4)) value. A predefined value file that is used by the Telemetry packet generator to input raw values for each test mnemonic and its representative key/derived parameter calculation.

Test Case Description: This test is designed to verify the ability of the FOS to automatically compute values of specified mnemonics based on context key mnemonics, whether the key be a discrete mnemonic key or derived parameter mnemonic.

Following sign-on, an alphanumeric telemetry page which includes EU conversion values for mnemonics and their context keys (both discrete and derived parameter keys) is invoked at the user station. The telemetry data driver is initiated, broadcasting housekeeping telemetry onto the FOS LAN in the form of EDUs. As telemetry packets are received and the telemetry information decommutated, telemetry displays are viewed and snapped at specified times.   These specified times coincide with EU changes initiated by the telemetry packet generator for specified mnemonic keys. Steps are then provided to ensure that when context keys are static or marked with bad quality, the output value of associated mnemonics are also marked as static.

Success Criteria: This test is considered successful when all EU converted values as shown on the display page match EU values from specified EU algorithm information when the context key value is applied, for both discrete parameters and derived parameter input. All context-associated mnemonics providing input to EU specifications, when marked as bad quality or static, result in static condition for the output mnemonics.

Step Id	Action	Expected Result/Output	Pass/ Fail

1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	
2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Bring up the Event Display. Select 'Event_Display' from the Control window tools menu.	The 'Event Display' is up on the FOT User Station.	

5.	At user station fose8oe, connect to a real-time operational string, take ground control and display the "Context" display page:
	
	    ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**
	
	    ECL> **TAKE GROUNDCONTROL STRING=100**
	
	    ECL> **P Context**
		Verify the following messages appear in the Event Display window:
		
		"Successfully connected to string 100".
		
		"Workstation fose8oe Given Ground control Authority"
		
		Verify the Context alphanumeric display appears at the user station and the following are displayed:
		
		  Mnemonic TBS(1) and its context key TBS(2).
		
		  Mnemonic TBS(3) and its context derived parameter key TBS(4) and SDU_PACKET_SEQ.	

6.	**EU based on Context Key:**	Verify (after one master cycle) that each mnemonic's "NODATA" and "STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active.
	At the real-time server, invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing.	
	In a new terminal window, enter the following:	
	%: **cd /fos/test/am1/scripts/setup**	
	%: **source packGenEnvVars**	
	%:**cd/fos/test/am1/bin/sun_sparc_5-5**	
	%: p**ackGen**	
	Enter tlm type: **am1-hk**	
	At the packGen prompt enter the following:	
	IP address = **225.2.7.00**	
	Port number = **20000**	
	Number of packets to send: **-1**	
	Packet delay in milliseconds: **8000**	
	Note: The file used by the packet generator will change the value of mnemonic TBS(1)'s context key (mnemonic TBS(2)), every major cycle, beginning with packet number **TBS.**	

7.	View the "Context" page and when packet TBS is received, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis to ensure the proper calculation of the EU value based on its context key. See table TLM2020B-1.	
8.	Repeat step 9 for fifteen more iterations (i.e. every major cycle following the receipt of packet TBS). Note: the context key TBS(2) changes value each major cycle, causing TBS(1)'s equation value to change.	The snaps are printed at the system printer. Collect the printouts for off-line analysis to ensure the proper calculations of the EU value of mnemonic TBS(1) based on context key TBS(2). See Table TLM2020B-1.	
9.	**EU based on Context Key of Derived Parameter:** The selected packet generator file will change the value of mnemonic TBS(3)'s EU context keyed derived parameter (TBS(4)) every master cycle starting at packet number **TBS**, but will keep mnemonic TBS(3) at a constant raw value setting. View the "Context" page and when packet TBS is received, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis to ensure the proper calculation of mnemonic TBS(3) based on its context key TBS(4). See table TLM2020B-2.	

10.	Repeat step 11 two more iterations (i.e. every major cycle following the receipt of packet TBS). Note: the derived parameter key result change should result in an EU value change for mnemonic TBS(3) each major cycle, beginning with packet number **TBS.**	The snaps are printed at the system printer. Collect the printouts for off-line analysis to ensure the proper calculations of the EU value of mnemonic TBS(3) based on its derived input of TBS(4). See Table TLM2020B-2.	
11.	**Context Dependency for Bad Quality Key:** Note: The packGenHKValues file will cause bad quality conditions for all mnemonics TBS(1)-TBS(4). Note: The selected packet generator file will change the value of mnemonic TBS(1)'s EU context key TBS(2) every master cycle starting at packet number **TBS**.		
12.	View the Event Display page.	Verify that event message TBD is displayed stating sequence error detection.	
13.	View the "Context" page and when packet TBS is received, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Verify that all mnemonics are flagged with the Static and Questionable Quality indicators.	

14.	Repeat step 18 two more iterations (i.e. every major cycle following the receipt of packet TBS). Note: the derived parameter key result change should result in an EU value change for mnemonic TBS(3) each major cycle, beginning with packet number **TBS.**	The snaps are printed at the system printer. Verify that mnemonics TBS(1) and TBS(3) are constant for each snap iteration (i.e. calculation is not performed due to questionable quality data).	
15.	**Context Dependency - Static Key:** Note: FREQ file set to skip packet TBS, which causes a STATIC condition for mnemonic TBS(1)'s context key (TBS(2)). Note: The selected packet generator file will change the value of mnemonic TBS(1)'s EU context key TBS(2) every master cycle starting at packet number **TBS**. View the Event Display page.	Verify that event message TBS event message is displayed stating missing packet.	
16.	View the "Context" page and when packet TBS is received, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Verify that mnemonics TBS(1) and TBS(2) are flagged with the Static indicators.	
17.	Repeat step 23 two more iterations (i.e. every major cycle following the receipt of packet TBS).	The snaps are printed at the system printer. Verify that mnemonics TBS(1) and TBS(3) remain flagged as STATIC and values on the display for these mnemonics do not change.	
18.	Stop the telemetry driver by entering CTRL-C in the telemetry driver windows.		

19.	Log off User Station.	
20.	End of test.	

Table 5-5. TLM2020B-1

TBS(2) Key Value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
TBS(1)EU Value	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS	TBS

Table 5-6. TLM2020B-2

TBS(4) Key Value	TBS	TBS	TBS
TBS(3) EU Value	TBS	TBS	TBS

322-CD-007-002/
411-CD-007-002

TLM - 2030B Engineering Unit Conversion

Test Case No.:	TLM 2030B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display "TLM2030B". Database with conversion information defined, including calibration coefficients based on seventh order or lower polynomial functions and linear interpolations of line segments containing up to 16 point pairs.

Test Case Description: This test is designed to verify the FOS' capability of providing conversions from raw values to Engineering Units (EU's) for all AM-1 supported real-time telemetry types. The basic demonstration will utilize test mnemonics with conversion curves and telemetry locations modeled after project defined mnemonics.

Following sign-on, alphanumeric telemetry pages which visually associate parameter and associated parameter EU value displays are invoked at the EOC user station. The telemetry data driver is initiated, broadcasting Housekeeping telemetry onto the FOS LAN in the form of EDUs. As telemetry packets are received and parameter EU conversions are displayed, telemetry displays are snapped. Parameter EU values as shown on alphanumeric displays are analyzed post-test to ensure EU values match the converted raw value when each parameter's database defined calibration coefficient is applied. The above steps are repeated for Health & Safety and Standby telemetry streams.

Success Criteria: This test is considered successful when EU values for all real-time telemetry types match conversions for telemetry driver applied raw data, and that EU values are displayed via telemetry display pages.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	
2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	

3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	Connect to a real-time operational string, to accept Housekeeping data, by entering the following in the ECL directive line of the Control window: ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	The following message will appear on the screen: "Successfully connected to string 100".	
8.	Iconify the "Status" window that appears after connecting to the string.	The window is iconified and appears at the top right of the user station.	

9.	At the user station, display "TLM2030B" alphanumeric page. This page contains parameters containing varied coefficients based on seventh order or lower polynomial functions and linear interpolations of line segments containing up to 16 point pairs - see table TLM2030B-1 for details. Enter the following in the ECL directive line of the Control window. ECL> **PAGE TLM2030B**	Verify the "TLM2030B" display appears at the user station and contains the following: Housekeeping Mnemonics: -GNC_SR_FIN_PTCHERR1 -MIS_IR_CAMERA_AN28V -AST_VR_M_MPSB_OUT -GNC_SR_LSEG1 Health and Safety Mnemonics: -GNC_IR_IRUB_MOTOR -GNC_SR_FIN_ROLLER1 -COM_IR_SSPA1 -COM_IR_LSEG2 Standby Mnemonics: -CDH_BR_STBY_CONV1 -CDH_NR_STBY_CONV3 -CDH_SR_STBY_CONV4 -CDH_SR_STBY_CONV5 -CDH_CR_LUSEG3 "STATIC" flags should be present for all descriptors.	

10.	Move the cursor over the "TLM2030B" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
13.	Highlight the "Assigned Connection" windows on the right and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
16.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgPackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

17.	To define the port to use for the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20001 APID=1**	The I.P. address and port should appear in the X-term window that the packet generator is running.	
18.	Start the previously built procedure which supplies the telemetry driver with values for mnemonics by entering the following in the ECL directive line of the Control window: ECL>**START TLM2030B**	An event message stating that the procedure controller has finished processing procedure TLM2030B will appear in the Event Display.	

| 19. | To start the telemetry driver, enter the following in the ECL directive line of the Control window:

ECL>**PG STARTDATA APID=1 COUNT=-1** | Verify (after one master cycle) that each mnemonic's:

-GNC_SR_FIN_PTCHERR1

-MIS_IR_CAMERA_AN28V

-AST_VR_M_MPSB_OUT

-GNC_SR_LSEG1

-GNC_IR_IRUB_MOTOR

-GNC_SR_FIN_ROLLER1

-COM_IR_SSPA1

-COM_IR_LSEG2

-CDH_BR_STBY_CONV1

-CDH_NR_STBY_CONV3

-CDH_SR_STBY_CONV4

-CDH_SR_STBY_CONV5

-CDH_CR_LUSEG3

"STATIC" flag indicators no longer appear on the display page and that the mnemonics listed above are marked as active. | |

20.	View the terminal window that the packet generator is running in and when packet 15 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
21.	View the terminal window that the packet generator is running in and when packet 30 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
22.	View the terminal window that the packet generator is running in and when packet 45 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
23.	View the terminal window that the packet generator is running in and when packet 60 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

24.	Stop the telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=1**	In the X-term window responsible for the multicast of Housekeeping telemetry (the telemetry driver), the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2030B" has stopped updating and that all mnemonics on the alphanumeric display page have become static.	
25.	Collect the printouts from the printer. Via offline analysis, at the end of the test, verify that the Housekeeping telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2030B-1.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2030B-1.	
26.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	
27.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	

28.	**Health and Safety EU Conversion**
	
	Invoke the EDOS telemetry driver for the multicast of Health and Safety telemetry packets for processing on the I channel.
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20002 APID=2**
	
	    ECL>**PG STARTDATA APID=2 COUNT=-1**
		Verify (after one master cycle) that each mnemonic's "STATIC" flag indicators no longer appear for the mnemonics listed below:
		
		-GNC_IR_IRUB_MOTOR
		
		-GNC_SR_FIN_ROLLER1
		
		-COM_IR_SSPA1
		
		-COM_IR_LSEG2
		
		Verify that mnemonics that are not defined as Health & Safety mnemonics are still flagged as "STATIC".	

29.	View the terminal window that the packet generator is running in and when packet 7 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
30.	View the terminal window that the packet generator is running in and when packet 15 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

31.	View the terminal window that the packet generator is running in and when packet 22 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
32.	View the terminal window that the packet generator is running in and when packet 30 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
33.	Stop the telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=2**	In the X-term window responsible for the multicast of Housekeeping telemetry (the telemetry driver), the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2030B" has stopped updating and that all mnemonics on the alphanumeric display page have become static.	
34.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	
35.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	

36.	Collect the printouts from the printer. Via offline analysis, at the end of the test, verify that the Health and Safety telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2030B-2.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2030B-2.	

37.	**Standby EU Conversion**
	
	Invoke the EDOS telemetry driver for the multicast of Health and Safety telemetry packets for processing on the I channel.
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20004 APID=5**
	
	    ECL>**PG STARTDATA APID=5 COUNT=-1**
		Verify (after one master cycle) that each mnemonic's "STATIC" flag indicators no longer appear on the display page and that the mnemonics listed below are marked as active:
		
		-CDH_BR_STBY_CONV1
		
		-CDH_NR_STBY_CONV3
		
		-CDH_SR_STBY_CONV4
		
		-CDH_SR_STBY_CONV5
		
		-CDH_CR_LUSEG3
		
		Verify that mnemonics that are not defined as Standby mnemonics are still flagged as "STATIC".	

38.	View the terminal window that the packet generator is running in and when packet 7 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

39.	View the terminal window that the packet generator is running in and when packet 15 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
40.	View the terminal window that the packet generator is running in and when packet 22 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
41.	View the terminal window that the packet generator is running in and when packet 30 is sent, snap the telemetry "TLM2030B" at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
42.	Stop the telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=5**	In the X-term window responsible for the multicast of Housekeeping telemetry (the telemetry driver), the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2030B" has stopped updating and that all mnemonics on the alphanumeric display page have become static.	

43.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	
44.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	
45.	Collect the printouts from the printer. Via offline analysis, at the end of the test, verify that the Health and Safety telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2030B-3.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2030B-3.	
46.	Log off the user station(s).		
47.	End of test.		

Table 5-7. TLM2030B-1

	Nth Order Poly	HKPG tlm. PKT 15	HKPG tlm. PKT 30	HKPG tlm. PKT 45	HKPG tlm. PKT 60
GNC_SR_FIN_PITCHERR1	2	-3.191	-4.385	-4.982	-2.594
MIS_IR_CAMERA_AN28V	3	0.717	0.358	0.036	0.430
AST_VR_M_MPSB_OUT	5	21.675	23.253	22.464	24.436
GNC_SR_LSEG1	16 pairs	35.00	12.00	100.00	40.00

Table 5-8. TLM2030B-2

	Nth Order Poly	H&S tlm. PKT 7	H&S tlm. PKT 15	H&S tlm. PKT 22	H&S tlm. PKT 30
GNC_TR_TRUB_MOTOR	3	39.140	130.037	-3209.831	120.995
GNC_SR_FIN_ROLLER1	2	0.746	-4.867	-1.190	-4.983
COM_IR_SSPA1	3	133.870	88.75	84.778	110.596
COM_IR_LSEG2	16 pairs	22.00	190.00	165.00	75.00

Table 5-9. TLM2030B-3

	Nth Order Poly	STBY tlm. PKT 7	STBY tlm. PKT 15	STBY tlm. PKT 22	STBY tlm. PKT 30
CDH_BR_STBY_CONV1	2	39.140	128.396	-10325.460	-3209.831
CDH_NR_STBY_CONV3	3	317.871	314.784	316.278	319.565
CDH_SR_STBY_CONV4	6	100.00	200.00	0.000	244.00
CDH_SR_STBY_CONV5	7	-22.459	17.346	-4.973	10.242
CDH_CR_LUSEG3	16 pairs	10.00	120.00	145.00	40.00

TLM-2040B User Adjustment of EU Conversion Algorithms & Coefficients

Test Case No.: TLM 2040B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display page , which includes all test polynomial EU based mnemonics and context key mnemonics. Housekeeping telemetry mnemonics defined in the I&T database with offsets matching those output by the telemetry data driver. A predefined procedure that is used by the Telemetry packet generator to input raw values for each mnemonic. Previously generated file containing test mnemonic EU and algorithm information for mnemonics GNC_SR_LSEG1, PMS_TR_REA_1, GNC_SR_ST_HKRY1, SDU_SCTIME, and SDU_PACKET_SEQ.

Test Case Description: This test is designed to verify the ability to adjust polynomial EU conversion algorithm information for specified mnemonics, including the selection of a conversion algorithm or its coefficients on a temporary basis. Error condition handling (i.e. attempting to select non-existent algorithms; attempting to select illegal coefficients), and tailored/mirrored processing of algorithm changes is also included in this test case.

Following sign-on, an alphanumeric telemetry page which includes EU conversion values is invoked at the user station. The telemetry data driver is initiated, broadcasting housekeeping telemetry onto the FOS LAN in the form of EDUs. As telemetry packets are received and the telemetry information decommutated, telemetry displays are viewed and snapped at specified times at both tailor and mirror-mode configured user stations.   These specified times will coincide with EU changes initiated by the user in the form of the "EU" ECL directive options. EU values residing on alphanumeric displays are analyzed post-test to ensure values match EU values when PDB information and/or EU changes initiated by the user are applied.

Success Criteria: This test is considered successful when all EU converted values as shown on the display page match EU values from specified EU algorithm information; all changes performed during mirror mode are reflected by all other connected users, and that changes made at a tailor-mode configured user station do not affect others connected to that string.

Step Id	Action	Expected Result/Output	Pass/ Fail

1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	
2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	**At User Station A** Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the "Control window" is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	Connect to a real-time operational string, to accept Health & Safety data, by entering the following in the ECL directive line of the Control window: ECL>**STRING CONNECT STRING=100 CONFIG= MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

8.	At the user station, display the "TLM2040B" alphanumeric page, which displays Housekeeping mnemonics and Packet information by entering the following in the ECL directive line of the Control window: ECL> **PAGE TLM2040B**	Verify the "TLM2000B" alphanumeric display appears at the user station and contains the following: -SDU_SCTIME -SDU_PACKET_SEQ -GNC_SR_LSEG1 -PMS_TR_REA_1 -GNC_SR_CONTXT -GNC_SR_ST_HKRY1 "STATIC" flags should be present for all descriptors.	
9.	Move the cursor over the "TLM2040B" alphanumeric page.		
10.	Click the mouse on the right button.		
11.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
12.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
13.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
14.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	

15.	**At User Station B** Log onto an FOT User Station. (Use a login account other than the account used at User Station A.) Start the User Station. Reference Test Case SYS2010B – User Station Startup and Authentication.	The FOT User Station is running and the "Control window" is displayed.	
16.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
17.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
18.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
19.	Connect to a real-time operational string, to accept Housekeeping data, by entering the following in the ECL directive line of the Control window: ECL>**STRING CONNECT STRING=100 CONFIG= MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

20.	At the user station, display the "TLM2040B" alphanumeric page, which displays Housekeeping mnemonics and Packet information by entering the following in the ECL directive line of the Control window: ECL> **PAGE TLM2040B**	Verify the "TLM2000B" alphanumeric display appears at the user station and contains the following: -SDU_SCTIME -SDU_PACKET_SEQ -GNC_SR_LSEG1 -PMS_TR_REA_1 -GNC_SR_CONTXT -GNC_SR_ST_HKRY1 "STATIC" flags or "NODATA" flags should be present for all descriptors.
21.	Move the cursor over the "TLM2040B" alphanumeric page.	
22.	Click the mouse on the right button.	
23.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.
24.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.
25.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.
26.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.

27.	**At User Station A** Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgpackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window at user station A.	
28.	To start the predefined procedure that is used by the telemetry packet generator to input raw values for each mnemonic, enter the following in the ECL directive line of the Control window: ECL>**START TLM2040B**	The event message "Procedure Controller finished processing procedure TLM2040B" will appear in the Global Event Display.	
29.	Take ground control of string 100 by entering the following in the ECL directive line of the Control window: ECL> **TAKE GROUNDCONTROL STRING=100** ECL>**TAKE COMMAND STRING=100**	The event message "Ground Control Authority has changed from user station xxx to xxx for string 100" will appear in the Global Event Display. The event message "Command Authority has changed from user station xxx to xxx for string 100" will appear in the Global Event Display.	

30.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20101 APID=1** ECL>**PG DELAY MILLS=3500 APID=1** ECL>**PG STARTDATA APID=1 COUNT=-1**	Verify the "TLM2000B" alphanumeric display appears at the user station and contains the following: -SDU_SCTIME -SDU_PACKET_SEQ -GNC_SR_LSEG1 -PMS_TR_REA_1 -GNC_SR_CONTXT -GNC_SR_ST_HKRY1 "STATIC" flag indicators no longer appear on the display page and that the mnemonics listed above are marked as active.	
31.	At user stations A and B, view the "TLM2040B" pages and when packet 15 is sent, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printout for off-line analysis. Verify snaps at user stations A and B are consistent (i.e. supply same EU information)	
32.	At user stations A and B, view the "TLM2040B" pages and when packet 30 is sent, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printout for off-line analysis. Verify snaps at user stations A and B are consistent (i.e. supply same EU information)	

33.	**<u>Adjustment of the Polynomial Coefficient</u>**:
	
	 At user station A, change the polynomial conversion coefficient of mnemonic PMS_TR_REA_1 conversion set (currently active) by entering the following:
	
	  ECL>**EU PMS_TR_REA_1**
	  CONVERSION=610 C2=100
	  STRING=100
		Verify that the event message:
		
		 "Successfully reconfigured string process."
		
		 Appears in the Event Display.	

34.	Thirty seconds following the change, snap the "TLM2040B" telemetry pages at user stations A and B by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis to ensure the proper calculation of the EU value of PMS_TR_REA_1 using the selected algorithm coefficient change. Verify that displays at both user stations A and B display the same EU values as the poly conversion adjustment selection affects both user stations.	

35.	At user station A, change the polynomial conversion coefficient of mnemonic GNC_SR_CONTXT non-active algorithm coefficient by entering the following:
	
	  ECL>**EU GNC_SR_CONTXT**
	  CONVERSION=610 C5=10 STRING=100
		Verify that the event message:
		
		 "Successfully reconfigured string process."
		
		 Appears in the Event Display.	

36.	Thirty seconds following the change, snap the "TLM2040B" telemetry pages at user stations A and B by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis to ensure the proper calculation of the EU value has not changed following the change to the non-active EU algorithm.	
37.	At user station B (currently in mirrored), change the polynomial conversion coefficient of mnemonic GNC_SR_LSEG1 first conversion set (currently active) by entering the following: ECL> **EU GNC_SR_LSEG1 CONVERSION=100 C2=55 STRING=100**	Verify that the event message: "Successfully reconfigured string process." Appears in the Event Display.	
38.	Thirty seconds following the change, snap the "TLM2040B" telemetry page at user stations A and B. %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis to ensure the proper calculation of the EU value at user station B, and that the EU value of mnemonic GNC_SR_LSEG1 as displayed on user station A.	
39.	**Polynomial Equation Selection:** At user station A, change the polynomial conversion equation of GNC_SR_CONTXT to equation 2 by entering the following: ECL> **EU GNC_SR_CONTXT SEL=291 STRING=100**	Verify that the event message: "Successfully reconfigured string process." Appears in the Event Display.	

40.	Thirty seconds following the change, snap the "TLM2040B" telemetry page at user stations A and B: %: **snap**	The snaps are printed at the system printer. Collect the printout for off-line analysis to ensure the proper calculation of the EU value of mnemonic GNC_SR_CONTXT using the selected algorithm. Verify that displays at both user stations A and B display the same EU values as the poly selection change affects both user stations.	
41.	At user station A, change the polynomial conversion equation of GNC_SR_CONTXT to equation 3 by entering the following: ECL> **EU GNC_SR_CONTXT SEL=406 STRING=100**	Verify that the event message: "Successfully reconfigured string process." Appears in the Event Display.	
42.	Thirty Seconds following the change, snap the "TLM2040B" telemetry page. %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis to ensure the proper calculation of the EU value of mnemonic GNC_SR_CONTXT using the selected algorithm.	
43.	At user station A, change the polynomial conversion equation of GNC_SR_CONTXT to equation 1 by entering the following: ECL> **EU GNC_SR_CONTXT SEL= 610 STRING=100**	Verify that the event message: "Successfully reconfigured string process." Appears in the Event Display.	
44.	Stop the Housekeeping telemetry by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=1**	Verify that an event message (indicating the telemetry driver has stopped) appears in the terminal window containing the telemetry driver. Verify that data stops flowing and all mnemonics on both display pages are marked as static.	

45.	**At User Station B**	Verify that the event message:	
	Disconnect from the string (in the mirror mode) by entering the following in the ECL directive line of the Control window:	"User Successfully disconnected from string 100" appears in the Event Display.	
	ECL>**STRING DISCONNECT STRING=100**		
46.	Reconnect to the real time string (in the tailored) mode by entering the following in the ECL directive line of the Control window:	The following message will appear in the Event Display window:	
	ECL>**STRING CONNECT STRING=100 CONFIG=TAILOR**	"Successfully connected to string 100".	
47.	Move the cursor over the "TLM2040B" alphanumeric page.		
48.	Click the mouse on the right button.		
49.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
50.	Click the mouse on the "Refresh" button.	The message "Data Sources Refreshed" will appear in the status box.	
51.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
52.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
53.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	

54.	**At User Station B** To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG STARTDATA APID=1 COUNT=-1**	Verify at both user stations that the mnemonics on the alphanumeric display page "TLM2040B" "STATIC" flag indicators no longer appear on the display page and that the mnemonics listed above are marked as active.	
55.	At user stations A and B, view the "TLM2040B" pages and when packet 15 is sent, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printout for off-line analysis. Verify snaps at user stations A and B are consistent (i.e. supply same EU information)	
56.	At user stations A and B, view the "TLM2040B" pages and when packet 30 is sent, snap the telemetry page by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printout for off-line analysis. Verify snaps at user stations A and B are consistent (i.e. supply same EU information)	
57.	**Adjustment of the Polynomial Coefficient**: At user station B (currently in tailored), change the polynomial conversion coefficient of mnemonic PMS_TR_REA_1 conversion set (currently active) by entering the following: ECL>**EU PMS_TR_REA_1** **CONVERSION=610 C1=1000** **STRING=100**	Verify that the event message: "Successfully reconfigured string process." Appears in the Event Display.	

58.	Thirty seconds following the change, snap the "TLM2040B" telemetry pages at user stations A and B by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis to ensure the proper calculation of the EU value of PMS_TR_REA_1 using the selected algorithm coefficient change. Verify that the EU value of mnemonic PMS_TR_REA_1 as displayed on user station A is not affected by the coefficient change made at user station B.	
59.	At user station B (currently in tailored), change the polynomial conversion coefficient of mnemonic GNC_SR_CONTXT non-active algorithm coefficient by entering the following: ECL>**EU GNC_SR_CONTXT** **CONVERSION=406 C3=160** **STRING=100**	Verify that the event message: "Successfully reconfigured string process." Appears in the Event Display.	
60.	Thirty seconds following the change, snap the "TLM2040B" telemetry pages at user stations A and B by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis to ensure the proper calculation of the EU value of GNC_SR_CONTXT using the selected algorithm coefficient change. Verify that the EU value of mnemonic GNC_SR_CONTXT as displayed on user station A is not affected by the coefficient change made at user station B.	

61.	At user station B (currently in tailored), change the polynomial conversion coefficient of mnemonic GNC_SR_LSEG1 first conversion set (currently active) by entering the following: ECL> **EU GNC_SR_LSEG1 CONVERSION=100 C3=160 STRING=100**	Verify that the event message: "UnSuccessfully reconfigured string process." Appears in the Event Display.	
62.	**Polynomial Equation Selection:** At user station B, change the polynomial conversion equation of GNC_SR_CONTXT to equation 2 by entering the following: ECL> **EU GNC_SR_CONTXT SEL=291 STRING=100**	Verify that the event message: "Successfully reconfigured string process." appears in the Event Display.	
63.	One minute following the change, snap the "TLM2040B" telemetry page at user stations A and B: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis to ensure the proper calculation of the EU value of GNC_SR_CONTXT using the selected algorithm coefficient change. Verify that the EU value of mnemonic GNC_SR_CONTXT as displayed on user station A is not affected by the poly selection made at user station B.	

64.	At user station A, change the polynomial conversion equation of GNC_SR_CONTXT to equation 4 by entering the following: ECL> **EU GNC_SR_ST_HKRY1 SEL= 290 STRING=100**	Verify that the event message: "Configuration of Decom Telemetry was unsuccessful." Appears in the Event Display.	
65.	One minute following the change, snap the "TLM2040B" telemetry page. %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis to ensure the proper calculation of the EU value of mnemonic TBS(1) using the selected algorithm.	
66.	Stop the Housekeeping telemetry by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=1**	Verify that data stops flowing and all mnemonics on both display pages are marked as "STATIC".	
67.	Log off user station.		
68.	End of test.		

TLM-2050B - Multi-Byte Parameter Processing

Test Case No.: TLM 2050B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display pages Header and multibyte. ODF files supporting contiguous and non-contiguous multi-byte parameters up to 64 bits and up to 8 pieces. Previously generated report outlining mnemonic to mnemonic offset mapping. Mnemonics CDH_BR_MULTI_1 16-bit contiguous EU, CDH_BR_MULTI_2 16 bit non-contiguous (3 pieces), CDH_BR_MULTI_3 32 bits (8 pieces) non-contiguous and CDH_BR_MULTI_4 36 bit (5 pieces) non-contiguous.

Test Case Description: This test is designed to verify the ability to decommutate and convert multi-byte parameters (contiguous and non-contiguous) in real-time telemetry formats.

Following sign-on, alphanumeric telemetry pages which include parameter and associated parameter decom value displays are invoked. The telemetry data driver is initiated, broadcasting values for previously defined multi-byte parameters. As telemetry packets are received and the telemetry information decommutated, telemetry displays are viewed and printed at specified times. Parameter values residing on alphanumeric displays are analyzed post-test to ensure decommutated values match scripted raw values for specified mnemonics.

Success Criteria: This test is considered successful when all multi-byte parameters are decommutated as specified and match data driven values; The database is able to support up to 8 pieces and 36 bits for any single multi-byte parameter; multi-byte parameters are not decommutated until the last "piece" of the multi-byte definition is received.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	

2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	Bring up the Event Display. Select 'Event_Display' from the Control window tools menu.	The 'Event Display' is up on the FOT User Station.	
8.	At user station connect to a real-time operational string. ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	Verify the following messages appear in the Event Display window: "Successfully connected to string 100".	

| 9. | At user station display the "Header" and "TLM2050B" display pages:

ECL> **PAGE Header**

ECL> **PAGE TLM2050B** | Verify the Header alphanumeric display appears at the user station and the following are displayed:

-Static flags for all descriptors

-NODATA flags for all descriptors

-Spacecraft time (SDU_SCTIME)

-Data Source (spacecraft ID) (EDS_SCID)

-Quality indicator (EDS_QUALITY)

-APID number (SDU_PCKT_APID)

-Packet sequence count (SDU_PACKET_SEQ)

-Header ID (SDU_SEC_HEADER)

-Packet length count (SDU_PCKT_LENGTH)

-Mstr. Cycle count (EDS_CYCLE_COUNT)

-Header Length (EDS_CCSDS_HDR_LENGTH)

-CCSDC Version (SDU_CCSDS_VER)

Verify the Multibyte alphanumeric display appears at the user station and the following are displayed:

-CDH_BR_MULTI_1

-CDH_BR_MULTI_2

-CDH_BR_MULTI_3

-CDH_BR_MULTI_4

"STATIC" flags should be present for all descriptors. | |

10.	Move the cursor over the "Header" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
13.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
16.	Move the cursor over the "TLM2010B" alphanumeric page and repeat steps 11-15.	The "Data Source Selector" window will disappear.	

17.	Invoke the EDOS telemetry driver for the multicast of Health & Safety telemetry packets for processing on the I channel.
	
	 In a new terminal window, enter the following:
	
	    %: **cd /fosb/test/am1/scripts/setup**
	
	    %: **setenv SCRIPT UserStation**
	
	    %: **source FosEnvVars**
	
	    %: **cd /fosb/test/am1/bin/sun_sparc_5-5**
	
	    %: **FtPgPackGen**
		The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

18.	Start the pre-defined procedure (used by the packet generator to assign values) by typing the following in the ECL directive line of the Control window: ECL>**START TLM2050B**	An event message stating that the procedure controller is starting TLM2050B appears in the Event Display window. The values assigned to each mnemonic will appear in the terminal window in which the telemetry driver was started. An event message stating that the Procedure Controller is finished processing TLM2050B appears in the Event Display window.	
19.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20002 APID=2** ECL> **PG DELAY MILLS=3000 APID=2** ECL>**PG STARTDATA APID=2 COUNT=-1**	Verify (after one Master Cycle) that all mnemonics "STATIC" flags disappear and all mnemonics are marked as "ACTIVE".	
20.	View the Header page and when packet 7 is received, snap the telemetry pages "TLM-2050B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

21.	View the header page and when packet 15 is sent, snap the telemetry pages "TLM-2050B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
22.	View the header page and when packet 22 is sent, snap the telemetry pages "TLM-2050B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
23.	View the header page and when packet 30 is sent, snap the telemetry pages "TLM-2050B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
24.	Stop the telemetry driver by entering the following in the directives line of the Control window: ECL> **PG STOPDATA APID=2**	Verify that all telemetry stops flowing and that all mnemonics are marked as static.	
25.	Via offline analysis, verify that mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCSDS_VER, and SDU_PACKET_SEQ as shown on screen snaps of the user station match values specified in Table TLM2050B-1.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2050B-1.	

26.	Via offline analysis, verify that the Health & Safety telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2050B-1.	The Health & Safety telemetry mnemonic CDH_BR_MULTI_1, as shown on screen snaps of the user station, will match values specified in Table TLM2050B-1.	
27.	Log off User Station.		
28.	End of test.		

Table 5-10. TLM2050B-1

	H & S tlm PKT 7	H & S tlm PKT 15	H & S tlm PKT 22	H & S tlm PKT 30
SDU_SCTIME	sequential	sequential	sequential	sequential
EDS_SCID	42	42	42	42
EDS_QUALITY	0	0	0	0
SDU_PCKT_APID	2	2	2	2
SDU_PCKT_LENGTH	202	202	202	202
SDU_PCKT_SEQ	7	15	22	30
SDU_CCSDS_VER	0	0	0	0
CDH_BR_MULTI_1	2	20	517	774
CDH_BR_MULTI_2	260	513	33283	33282
CDH_BR_MULTI_3	65792	273	273	285278465
CDH_BR_MULTI_4	2101249	536870913	806371360	807407616

Derived Parameter Processing

Test Case No.: TLM 2060B	

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display pages "Header" and "DRParm". Housekeeping telemetry mnemonics defined in the I&T database with offsets matching those output by the telemetry data driver. Fifty-five (55) derived parameters (TBS(1)…..TBS(55) and TBS(A)….TBS(G) which are defined using arithmetic operators (addition, subtraction, negation, multiplication, division, sine, arcsine, cosine, arccosine, tangent, and arctangent).

Test Description: This test is designed to verify the FOS's capability of processing spacecraft/instrument Housekeeping data via special computations using predefined algorithms. These simple calculations will be done via derived parameters. Derived parameters are built by combining existing parameters via arithmetic or logical functions. It will be possible to use predefined analog, discrete, constant, or other derived values as a source to build a new derived parameter.

Following sign-on, alphanumeric telemetry pages which include parameter and associated parameter Decom value displays are invoked at the user station. The telemetry data driver is initiated, broadcasting Housekeeping telemetry onto the FOS LAN in the form of EDU's. As telemetry packets are received and the telemetry information decommutated, telemetry displays are viewed and snapped at specified times. Parameter values residing on alphanumeric displays are analyzed post-test to ensure derived parameter values match scripted values for specific mnemonics.

Success Criteria: The test is considered successful when all Housekeeping mnemonics are decommutated and calculated as specified and match data driven values; values as seen on multiple user stations match data driven values; and static and NODATA flags are disabled from alphanumeric telemetry displays upon active data periods.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	

2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Bring up the Event Display. Select 'Event_Display' from the Control window tools menu.	The 'Event Display' is up on the FOT User Station.	
5.	Connect to a real-time operational string, to accept Health & Safety data, by entering the following in the ECL directive line of the Control window: ECL>**STRING CONNECT STRING=100 CONFIG= MIRROR** ECL>**TAKE GROUNDCONTROL STRING=100**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

| 6. | At the user station, display the EDU Header and "DRParm" alphanumeric pages which displays telemetry header field values by entering the following:

    ECL>**P Header**

    ECL>**P DRParm** | Verify the Header window appears at the user station and contains the following fields:

-Mnemonic descriptors

-Static flags for all descriptors

-NODATA flags for all descriptors

-Spacecraft time (SDU_SCTIME)

-Data source (spacecraft ID) (EDS_SCID)

-Quality indicator (EDS_QUALITY)

-APID number (SDU_PCKT_APID)

-Packet sequence count -SDU_PACKET_SEQ)

-Packet length count (SDU_PCKT_LENGTH)

-CCSDC Version (SDU_CCSDS_VER)

Verify the "DRParm" display appears at the user station and contains the following:

-Mnemonics TBS(1)…..TBS(7)

-Mnemonics TBS(A)….TBS(G) | |
| 7. | Disable the limit notification messages for all parameters by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS ALL MESSAGE=OFF** | A message TBS will appear in the Event Display window stating that all limit messages have been turned off. | |

8.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fos/test/am1/scripts/setup** %: **source A2tlmEnvVars** %: **cd /fos/test/am1/bin/sun_sparc_5-5** %: **A2tlm** Enter tlm type: **am1-hk** At the A2tlm prompt enter the following: IP address = **224.2.7.20** Port number = **20000** Number of packets to send: **-1** Packet delay in milliseconds: **8000**	Verify that the following message appears on the screen: "%s Decom: Ready to receive telemetry packets." Verify that telemetry begins to flow.	
9.	View the real-time server and when packet V is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	All mnemonics will be marked "NODATA" and "STATIC" flag indicators will appear the display page.	

10.	View the real-time server and when packet W is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Mnemonics TBS(1), TBS(3), TBS(4) and TBS(F)'s "NODATA" and "STATIC" flag indicators no longer appear on the "DRParm" display page and the mnemonics are marked as active. All other mnemonics TBS(2), TBS(5), TBS(6), TBS(7), TBS(A), TBS(B), TBS(C), TBS (D), will be marked "NODATA" and "STATIC" flag indicators will appear the display page.	
11.	View the real-time server and when packet X is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. The Housekeeping mnemonics TBS(5), TBS(6), TBS(7), TBS(B), and TBS(C)'s "NODATA" or "STATIC" flag indicators no longer appear on the display page and the mnemonics are marked as active. The Housekeeping mnemonics TBS(2), TBS(A), TBS(D), TBS(E) and TBS(G)'s "NODATA" and "STATIC" flag indicators will still appear on the display page.	

12.	View the real-time server and when packet Y is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. All Housekeeping mnemonics "NODATA" or "STATIC" flag indicators no longer appear on the display page and all mnemonics are marked as active.	
13.	View the real-time server and when packet Z is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
14.	Via offline analysis, verify that mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCSDS_VER, and SDU_PACKET_SEQ as shown on screen snaps of the user station match values specified in Table TLM2060B-1.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2060B-1.	
15.	Via offline analysis, verify that the Housekeeping telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2060B-1.	The Health & Safety telemetry mnemonic TBS(2), as shown on screen snaps of the user station, will match values specified in Table TLM2060B-1.	
16.	**<u>Disabling of Derived Processing</u>** Disable the derived parameter processing by entering the following in the ECL directive line of the Control window: ECL> **DERIVED TBS(F)=0**	A message TBS will appear in the Event Display window stating that derived parameter processing for mnemonic TBS(F) has been disabled.	

17.	View the real-time server and when packet V is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
18.	View the real-time server and when packet W is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
19.	View the real-time server and when packet X is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
20.	View the real-time server and when packet Y is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
21.	View the real-time server and when packet Z is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

22.	Via offline analysis, verify that mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCSDS_VER, and SDU_PACKET_SEQ as shown on screen snaps of the user station match values specified in Table TLM2060B-2.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2060B-2.	
23.	Via offline analysis, verify that the Housekeeping telemetry mnemonics, as shown on screen snaps of the user station, match values specified in Table TLM2060B-2.	The Health & Safety telemetry mnemonic TBS(2), as shown on screen snaps of the user station, will match values specified in Table TLM2060B-2.	
24.	**Derived Processing Interval Adjustment** Adjust the evaluation/update rate of mnemonic TBS(F) by entering the following in the ECL directive line of the Control window: ECL> **DERIVED TBS(F)=30**	A message TBS will appear in the Event Display window stating that interval for derived parameter re-evaluation for mnemonic TBS(F) has been set to 30 seconds.	
25.	View the real-time server and when packet W is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
26.	View the real-time server and when packet X is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

27.	View the real-time server and when packet Y is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
28.	View the real-time server and when packet Z is sent, snap the telemetry page DRParm at the user station by entering the following inside the console window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
29.	Via offline analysis, verify that mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCSDS_VER, and SDU_PACKET_SEQ as shown on screen snaps of the user station match values specified in Table TLM2060B-3.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in Table TLM2060B-3.	
30.	Via offline analysis, verify that the Housekeeping telemetry mnemonics TBS(1), TBS(4), and TBS(F), as shown on screen snaps of the user station, match values specified in Table TLM2060B-3.	The Health & Safety telemetry mnemonic TBS(2), as shown on screen snaps of the user station, will match values specified in Table TLM2060B-3.	
31.	Attempt to adjust the evaluation/update rate of mnemonic TBS(F) to less than (1) spacecraft clock second by entering the following in the ECL directive line of the Control window: ECL> **DERIVED TBS(F)=.5**	An event message TBS appears on the Event display window stating that (.5) is not a valid interval value.	

32.	Exit the telemetry driver by entering CTRL-C in the console window where the Telemetry driver was running.		
33.	Log off the user station(s).		
34.	End of test.		

TLM-2070B Data Quality Determination

Test Case No.: TLM 2070B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display page "TLM2070B" which includes all test mnemonics. Housekeeping, Health & Safety and Standby telemetry mnemonics defined in the I&T database with offsets matching those output by the telemetry data driver. A pre-defined procedure will be used to supply the telemetry driver with values (create bad quality data).

Test Case Description: This test is designed to verify the ability to report on telemetry packets containing bad quality status.

Following sign-on, an alphanumeric telemetry page "Quality", which includes parameter Decom value and associated flags is invoked at the user station. The telemetry data driver is initiated, broadcasting housekeeping telemetry onto the FOS LAN in the form of EDUs. As telemetry packets are received from EDOS, alphanumeric displays and event messages are analyzed to ensure quality flags displayed are for parameters residing in bad quality packets, and that event messages/alarms are generated during the bad quality data receipt condition(s). The above steps are repeated for Health & Safety telemetry.

Success Criteria: This test is considered successful when Quality flags are displayed for all Housekeeping/Health & Safety parameters residing in a bad quality packet. For each parameter, upon the first instance of good quality data for that parameter, the bad quality flag is overwritten with the "active" flag. Event messages reflect accurate bad quality data-good quality transitions.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	

2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	At user station, connect to a real-time operational string by entering the following in the ECL directive line of the Control window: ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	Verify the following messages appear in the Event Display window: "*Successfully connected to string 100*".	

8.	At user station, display the "Header" display page by entering the following in the ECL directive line of the Control window:	Verify the Header window appears at the user station and contains the following fields:	
	ECL> **PAGE Header**	-Static flags for all descriptors	
		-Spacecraft time (SDU_SCTIME)	
		-Data source (spacecraft ID) (EDS_SCID)	
		-Quality indicator (EDS_QUALITY)	
		-APID number (SDU_PCKT_APID)	
		-Packet sequence count SDU_PACKET_SEQ)	
		-Header ID (SDU_SEC_HEADER)	
		-Packet length count (SDU_PCKT_LENGTH)	
		-Mstr. Cycle Count (EDS_CYCLE_COUNT)	
		-Header Length (EDS_CCSDS_HDR_LENGTH)	
		-CCSDC Version (SDU_CCSDS_VER)	

9.	At user station, display the "TLM2070B" display page by entering the following in the ECL directive line of the Control window:	Verify the "TLM2070B" alphanumeric display appears at the user station and the following are displayed:	
	ECL> **PAGE TLM2070B**	-GNC_BR_TORQ_MODE_2	
		-GNC_SR_FIN_PTCHERR1	
		-CDH_CR_SSR1_CMDBUS	
		-EPS_IR_QLTY_1	
		-COM_SR_KSAM1_ISTAT	
		-GNC_BR_ESA1_TRL_EDG	
		-GNC_SR_SHDPB_TAM_Z	
		-MOD_CR_QLTY_2	
		-CDH_CR_ACT_RPT_TYP	
		-CDH_BR_CDHBDU_VALDAT	
		-CDH_NR_QLTY3	
		-CDH_SR_QLTY4	
		"STATIC" "flags for all descriptors	
		NOTE: Mnemonics GNC_BR_TORQ_MODE_2 and GNC_SR_FIN_PTCHERR1 will reside in every packet. CDH_CR_DCU1CMDBUS will reside in packets 39 and 55. EPS_IR_QLTY1 will reside in packets 14 and 55. Packets 14 and 55 via the driver, will be marked as bad quality.	

10.	Move the cursor over the "Header" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
13.	Highlight the "Assigned Connection" windows on the right and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
16.	Move the cursor over the "TLM2070B" alphanumeric page and repeat steps 11-15.	The "Data Source Selector" window will disappear.	
17.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgPackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

18.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20001 APID=1** ECL>**PG STARTDATA APID=1 COUNT=-1**	Verify that each mnemonic's "STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active. Housekeeping telemetry should begin to flow on the I channel.	
19.	During the first master cycle, enter the following in the ECL directive line of the Control window: ECL> **PG CHANGE AREA=SERVICE OFFSET=145 LENGTH=1 VALUE=1 APID=1 PKTNO=14** ECL> **PG CHANGE AREA=SERVICE OFFSET=145 LENGTH=1 VALUE=1 APID=1 PKTNO=55**	The two ECL directives are used to create bad quality data in packets 14 and 55 via the telemetry driver.	
20.	During the second master cycle, view the Header page and when packet 7 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	Verify that each mnemonic's "STATIC" flag indicator no longer appears on any of the display pages and that the mnemonics are marked as active.	

21.	View the Header page and when packet 14 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis. Verify that each mnemonic in packet 14 is marked with a "Q" as a Bad Quality indicator. Verify that the notification message below appears in the Event display window: *"I: Decom: Packet failed Reed-Solomon verification."* **NOTE:** CDH_CR_SSR1_CMDBUS is not in packet 14 and therefore won't be marked as bad quality.	
22.	View the "Header" page and when packet 20 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Verify that each mnemonic's "Q" (bad quality indicator) no longer appears on any of the display pages. STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active.	
23.	View the "Header" page and when packet 55 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis. Verify that each mnemonic is marked with a "Q" as a Bad Quality indicator. Verify that the notification message below appears in the Event display window: *"I: Decom: Packet failed Reed-Solomon verification."*	

24.	View the "Header" page and when packet 63 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Verify that each mnemonic's "Q" (bad quality indicator) no longer appears on any of the display pages. STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active.	
25.	Stop the telemetry driver by entering the following in the directive line of the Control window: ECL> **PG STOPDATA APID=1**	Verify that telemetry stops flowing.	
26.	Enter the following in the ECL directive line of the Control window: ECL> **PG CHANGE AREA=SERVICE OFFSET=145 LENGTH=1 VALUE=1 APID=2 PKTNO=14**	This will create bad quality data in packet 14 once Health & Safety telemetry begins to flow.	

27.	To start the telemetry driver to multicast Health and Safety telemetry, enter the following in the ECL directive line of the Control window:
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20002 APID=2**
	
	    ECL>**PG STARTDATA APID=2 COUNT=-1**		

28.	Monitor, for one Master cycle.	Verify that each mnemonic's "STATIC" flag indicator no longer appears on any of the display pages and that the mnemonics are marked as active.	
29.	View the Header page and when packet 7 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	Verify that each mnemonic is marked as active and that none are marked with a "Q" as a Bad Quality indicator.	
30.	View the Header page and when packet 14 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis. Verify that each mnemonic in packet 14 is marked with a "Q" as a Bad Quality indicator. Verify that the notification message below appears in the Event display window: *"%s Decom: Packet failed Reed-Solomon verification."*	
31.	View the Header page and when packet 20 is sent, snap the telemetry pages "Header" and "TLM2070B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Verify that each mnemonic's "Q" (bad quality indicator) no longer appears on any of the display pages. STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active.	

32.	Stop the telemetry driver by entering the following in the directive line of the Control window: ECL> **PG STOPDATA APID=2**	Verify that telemetry stops flowing. Verify that all mnemonics on telemetry pages "Header" and "TLM2070B" are marked as static.	
33.	Log off User Station.		
34.	End of test.		

TLM-2080B Red/Yellow Limits Processing

Test Case No.: TLM 2080B

Test Title: Limits Processing

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously generated information outlining parameter limit information. Input data file "packGenHKValues" used to supply the telemetry driver with values.

Test Description: This test is designed to verify the ability to report on individual telemetry parameter limit violations according to a given parameter's associated raw/EU limits database definition. This test will also verify the ability to change limits information via ECL directives.

Following sign-on and initiation of the I&T database as the operational database and initialization of a real-time string in support of the AM-1 spacecraft, alphanumeric display pages and the real-time events page are invoked. The telemetry data driver is initiated, broadcasting housekeeping telemetry onto the FOS LAN at a rate of 16 kbps. Limit conditions are simulated, ranging from red low limit violation to red high limit violations; alphanumeric and event pages are snapped at specified periods and compared against scripted limits conditions to determine accuracy of limits reporting.

Success Criteria: This test is considered successful when event messages are generated and displayed for each mnemonic incurring a limit violation or change in violation (i.e. yellow to red/red to yellow) and for those conditions where individual parameter limit violations become nominal; limits and limit sense intervals are modified via ECL directives.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	

2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the "Control window" is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	At the user station connect to a real-time operational string, to accept Housekeeping data, by entering the following in the ECL directive line of the Control window: ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	
8.	At the user station take ground control by entering the following in the ECL directive line of the Control window: ECL> **TAKE GROUNDCONTROL STRING=100**	The following message will appear in the Event Display window: "Ground control switched from user station *xxx* to user station *xxx*"	

9.	At the user station, display the alphanumeric "Header" display page by entering the following in the ECL directive line of the Control window::	Verify the "Header" and "TLM-2080B" alphanumeric display pages appear at the user station and the following mnemonics appear on the display:	
	ECL>**PAGE Header**	-Spacecraft time (SDU_SCTIME)	
		-Data source (spacecraft ID) (EDS_SCID)	
		-Quality indicator (EDS_QUALITY)	
		-APID number (SDU_PCKT_APID)	
		-Packet sequence count SDU_PACKET_SEQ)	
		-Packet Header (SDU_SEC_HEADER)	
		-Packet length count (SDU_PCKT_LENGTH)	
		-Cycle Count (EDS_CYCLE_COUNT)	
		-Header Length (EDS_CCSDS_HDR_LENGTH)	
		-CCSDS Version (SDU_CCSDS_VER)	
		"STATIC" flags flags should be present for all descriptors.	

10.	At the user station, display the alphanumeric "TLM2080B" display page by entering the following in the ECL directive line of the Control window:: **ECL>PAGE TLM2080B**	Verify the "TLM-2080B" alphanumeric display page appears at the user station and the following mnemonics appear on the display: -EPS_TR_BPC2_A -GNC_SR_ST_HKRY1 -SMS_SR_HGA_DS_POTA -GNC_IR_IRUB_MOTOR -MOD_CR_CP_HSRY1 -SMS_SR_HGA_DS_POTB -CDH_CR_CERA_SBRY1 -CDH_NR_ST_SBRY2 -CDH_NR_ACT_B_FRCNT "STATIC" flags flags should be present for all descriptors.	
11.	Move the cursor over the "Header" alphanumeric page.		
12.	Click the mouse on the right button.		
13.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
14.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	

15.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
16.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
17.	Move the cursor over the "TLM2010B" alphanumeric page and repeat steps 12-16.	The "Data Source Selector" window will disappear.	
18.	Disable the limit notification messages for all parameters by entering the following in the ECL directive line of the Control window: ECL>**LIMITS OFF STRING=100**	Verify the event message "String successfully reconfigured" appears in the Event display window.	
19.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing on the I channel. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgPackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

20.	Start the procedure which scripts values for the mnemonics to break Red/Yellow limits by entering the following in the ECL directives line of the Control window: ECL>**START TLM2080B**	Verify that the event message "Procedure Controller finished processing procedure TLM2080B."	
21.	Start the packet generator by entering the following in the ECL directives line of the Control window: ECL>**PG STARTDATA APID=1 COUNT=-1**	Verify (after one master cycle) that each mnemonic's "STATIC" flag indicators no longer appear on any of the display pages and that mnemonics are marked as active. The telemetry mnemonics change in limit condition every update. Each telemetry mnemonic violating a limit condition is marked so accordingly (i.e. RED HIGH, YELLOW HIGH, YELLOW LOW, RED LOW).	

| 22. | **<u>Verify Limits Calculation/Reporting</u>**

View the "Header" page and when packet 15 is sent, snap the telemetry pages "TLM2080B" and "Header" at the user station by entering the following inside a terminal window:

    %: **snap** | The snap is printed at the system printer. Collect the printout for off-line analysis and verify that the mnemonics on the display page are marked as:

EPS_TR_BPC2_A - Red Low

GNC_SR_ST_HKRY1 - Red Low

Verify that the following notification messages appear in the event display window:

"I Decom: EPS_IR_BPC2 Red Low limit violation: %   (lo: -12.00, hi: 13.00)"

"I Decom: GNC_SR_ST_HKRY1 Red Low limit violation: %   (lo: 10.00 hi: 50.00)"

NOTE: A notification is received for every change in limit condition for each telemetry mnemonic. The notification will contain the following:

-Current packet time stamp

-Telemetry mnemonic

-Parameter value

-Limit condition

-Assigned limit values

Notifications without an Alarm are received for yellow limit violations. Notifications with an Alarm are received for red violations.

(**NOTE**: Acknowledge Alarm messages via mouse selection.) | |

23.	View the events in the Control window.	Verify that the same "Alarm" event message appears in the Control window and is highlighted..	
24.	Click on "ACK" button in the Control window.	Events will begin to scroll through Events Display window.	
25.	View the "Header" page and when packet 21 is sent, snap the telemetry pages "TLM2080B" and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the mnemonics on the display page are marked as: EPS_TR_BPC2_A - Red High GNC_SR_ST_HKRY1 - Red High and the notification messages: *"I Decom: EPS_IR_BPC2_A Red hi limit violation: %s (lo:-12.00 , hi 50.00:)"* *"I Decom: GNC_SR_ST_HKRY1 Red hi limit violation: % (lo: 10.00 hi: 50.00)"* appear in the event display window. Notifications without an Alarm are received for yellow limit violations. Notifications with an Alarm are received for red violations. (**NOTE**: Acknowledge Alarm messages via mouse selection.)	

| 26. | View the "Header" page and when packet 30 is sent, snap the telemetry pages "TLM2080B" and "Header" at the user station by entering the following inside a terminal window:

    %: **snap** | The snap is printed at the system printer. Collect the printout for off-line analysis.

Verify that the mnemonics on the display page are marked as:

EPS_TR_BPC2_A - Red High

GNC_SR_ST_HKRY1 - Red High

Verify a notification message appears in the event display window:

"I Decom: EPS_IR_BPC2_A Red hi limit violation: %s   (lo:-12.00 , hi 50.00:)"

"I Decom: GNC_SR_ST_HKRY1 Red hi limit violation: %   (lo: 10.00 hi: 50.00)"

Notifications with an Alarm are received for red violations.

(NOTE: Acknowledge Alarm messages via mouse selection.) | |

| 27. | View the "Header" page and when packet 40 is sent, snap the telemetry pages "TLM2080B" and "Header" at the user station by entering the following inside a terminal window:

%: **snap** | The snap is printed at the system printer. Collect the printout for off-line analysis.

Verify that the mnemonics on the display page are marked as:

EPS_TR_BPC2_A - Yellow High

GNC_SR_ST_HKRY1 - Yellow High

and the following event messages

"I Decom: EPS_IR_BPC2_A Yellow hi limit violation: %s   (lo:-9.00 , hi 11.00:)"

"I Decom: GNC_SR_ST_HKRY1 Yellow hi limit violation: %   (lo: 20.00 hi: 40.00)"

appear in the event display window.

Notifications without an Alarm are received for yellow limit violations.

(NOTE: Acknowledge Alarm messages via mouse selection.) | |

| 28. | View the "Header" page and when packet 52 is sent, snap the telemetry pages "TLM2080B" and "Header" at the user station by entering the following inside a terminal window:

    %: **snap** | The snap is printed at the system printer. Collect the printout for off-line analysis.

Verify that the mnemonics on the display page are marked as:

EPS_TR_BPC2_A - Red High

GNC_SR_ST_HKRY1 - Red High

and the notification messages:

"I Decom: EPS_IR_BPC2_A Red hi limit violation: %s (lo:-12.00 , hi 50.00:)"

"I Decom: GNC_SR_ST_HKRY1 Red hi limit violation: % (lo: 10.00 hi: 50.00)"

appear in the event display window.

Notifications with an Alarm are received for red violations

(NOTE: Acknowledge Alarm messages via mouse selection). | |

| 29. | View the "Header" page and when packet 63 is sent, snap the telemetry pages "TLM2080B" and "Header" at the user station by entering the following inside a terminal window:

    %: **snap** | The snap is printed at the system printer. Collect the printout for off-line analysis.

Verify that the mnemonics on the display page are marked as:

EPS_TR_BPC2_A - Red High

GNC_SR_ST_HKRY1 - Normal

and a notification message:

"I Decom: EPS_IR_BPC2_A Red hi limit violation: %s (lo:-12.00 , hi 50.00:)"

 will appear in the event display window.

Notifications with an Alarm are received for red violations.

(NOTE: Acknowledge Alarm messages via mouse selection) | |

| 30. | **EU Limit Adjustment**

Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

ECL> **LIMITS EPS_TR_PBC2_A EU GROUP=1 TYPE=RED HL=30** | Verify that an event message

"Successfully reconfigured string process"

is displayed, verifying that the Red High Limit for mnemonic EPS_TR_BPC2_A has been modified.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 15 - Mnemonic EPS_TR_BPC2_A is Red Low

-Packet 21 - Mnemonic EPS_TR_BPC2_A is Yellow High

-Packet 40 - Mnemonic EPS_TR_BPC2_A is Yellow High

-Packet 52 - Mnemonic EPS_TR_BPC2_A is Red High

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 31. | Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS EPS_TR_PBC2_A**
    EU GROUP=1 TYPE=YELLOW HL=26 | Verify that an event message

"Successfully reconfigured string process"

is displayed, verifying that Yellow High Limit for mnemonic EPS_TR_BPC2_A has been modified.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 15 - Mnemonic EPS_TR_BPC2_A is Red Low

-Packet 21 - Mnemonic EPS_TR_BPC2_A is Normal

-Packet 40 - Mnemonic EPS_TR_BPC2_A is Normal

-Packet 52 - Mnemonic EPS_TR_BPC2_A is Normal

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 32. | Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS EPS_TR_PBC2_A EU GROUP=1 TYPE=YELLOW LL=22** | Verify that an event message

"Successfully reconfigured string process"

is displayed, verifying that the Yellow Low Limit for mnemonic EPS_TR_BPC2_A has been modified.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 15 - Mnemonic EPS_TR_BPC2_A is Red Low

-Packet 21 - Mnemonic EPS_TR_BPC2_A is Yellow Low

-Packet 40 - Mnemonic EPS_TR_BPC2_A is Yellow Low

-Packet 52 - Mnemonic EPS_TR_BPC2_A is Yellow Low

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 33. | Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS EPS_TR_PBC2_A EU GROUP=1 TYPE=RED LL=18** | Verify that an event message

"Successfully reconfigured string process"

is displayed, stating that Red Low Limit for mnemonic EPS_TR_BPC2_A has been modified.

Monitor (for one master cycle) the "TLM2080B" alphanumeric display and the Event display and verify the following:

-Packet 15 - Mnemonic EPS_TR_BPC2_A is Red Low

-Packet 21 - Mnemonic EPS_TR_BPC2_A is Red Low

-Packet 40 - Mnemonic EPS_TR_BPC2_A is Red Low

-Packet 52 - Mnemonic EPS_TR_BPC2_A is Red Low

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |
| 34. | Stop the Housekeeping telemetry by entering the following in the ECL directives line of the Control window:

    ECL>**PG STOPDATA APID=1** | Verify that the Housekeeping telemetry stops flowing and that all mnemonics are marked as "STATIC". | |

35.	Start the packet generator flowing Health and Safety telemetry by entering the following in the ECL directives line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20102 APID=2** ECL>**PG STARTDATA APID=2 COUNT=-1**	Verify (after one master cycle) that each Health and Safety mnemonic's "STATIC" flag indicators no longer appear on any of the display pages and that mnemonics are marked as active.	
36.	**<u>Limits Reporting Options</u>** Disable the limit notification messages for all parameters by entering the following in the ECL directive line of the Control window: ECL> **LIMITS MODIS MESSAGE=ON STRING=100**	Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following: The telemetry mnemonics change in limit condition every update. Each telemetry mnemonic violating a limit condition is marked so accordingly (i.e. RED HIGH, YELLOW HIGH, YELLOW LOW, RED LOW). A notification event message is received for changes in limit condition for mnemonics GNC_SR_ST_HKRY1, EPS_IR_BPC2_A (these mnemonics are already turned on) and MOD_CR_CP_HSRY1, which is in the MODIS subsystem.	

37.	Enable the limit notification messages for all parameters by entering the following in the ECL directive line of the Control window:
	
	    ECL> **LIMITS GNC_IR_IRUB_MOTOR MESSAGE=ON**
	
	    ECL> **LIMITS MODIS MESSAGE=ON**
		Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following:
		
		The Health and Safety mnemonics are marked as:
		
		GNC_IR_IRUB_MOTOR - Red Low
		
		MOD_CR_CP_HSRY1 - Yellow Low
		
		Notifications without an Alarm are received for yellow limit violations.
		
		Notifications with an Alarm are received for red violations.
		
		(**NOTE**: Acknowledge Alarm messages via mouse selection.)	

38.	Attempt to enable the limit notification messages for telemetry SMS_SR_HGA_DS_POTB by entering the following in the ECL directive line of the Control window: ECL> **LIMITS SMS_SR_HGA_DS_POTB MESSAGE=ON**	Verify that an event message *"Unable to reconfigured string process"* stating there are no limits defined for SMS_SR_HGA_DS_POTB appears in the event display window.	

| 39. | **Raw Limit Set Selection**

Enable the limit notification messages for telemetry MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS MOD_CR_CP_HSRY1 MESSAGE=ON**

(Mnemonic MOD_CR_CP_HSRY1 will be used to verify raw group selection and limit change in the following steps.) | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic MOD_CR_CP_HSRY1 is on.

Monitor (for one master cycle) the "TLM2080B" alphanumeric display and the Event display and verify the following:

Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is Red Low

Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low

Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is Yellow High

Packet 31 - Mnemonic MOD_CR_CP_HSRY1 is RED High

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 40. | Select range limit group two for MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS MOD_CR_CP_HSRY1 SEL=2** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic MOD_CR_CP_HSRY1 is on.

Monitor (for one master cycle) the "TLM2080B" alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is Red Low

-Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low

-Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is Normal

-Packet 31 - Mnemonic MOD_CR_CP_HSRY1 is Yellow High

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 41. | Select range limit group three for MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS MOD_CR_CP_HSRY1 SEL=3** | Verify that an event message TBS is displayed, stating that reporting for mnemonic MOD_CR_CP_HSRY1 is on.

Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low

-Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is Normal

-Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is Yellow High

-Packet 31 - Mnemonic MOD_CR_CP_HSRY1 is Red High

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 42. | Select range limit group four for MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS MOD_CR_CP_HSRY1 SEL=4** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic GNC_SR_ST_HKRY1 is on.

Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is RED LOW

-Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is RED LOW

-Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is Normal

-Packet 31 - Mnemonic MOD_CR_CP_HSRY1 is Normal

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 43. | Select range limit group two for MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS MOD_CR_CP_HSRY1 SEL=1** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic MOD_CR_CP_HSRY1 is on.

Monitor (for one master cycle) the "TLM2080B" alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is Red Low

-Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low

-Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is Yellow High

-Packet 31 - Mnemonic MOD_CR_CP_HSRY1 is RED High

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

NOTE: Acknowledge Alarm messages via mouse selection. | |

44.	**Raw Limit Adjustment**	Verify that an event message TBS is displayed, stating that Red LL for mnemonic GNC_SR_ST_HKRY1 has been modified.	
	Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:	Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following:	
	ECL> **LIMITS MOD_CR_CP_HSRY1 RAW GROUP=1 TYPE=RED LL=0**	-Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low	
		-Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low	
		-Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low	
		-Packet 30 - Mnemonic MOD_CR_CP_HSRY1 is Yellow Low	
		Notifications without an Alarm are received for yellow limit violations.	
		Notifications with an Alarm are received for red violations.	
		(The notifications will contain the 5 characteristics mentioned in step 8.)	
		NOTE: Acknowledge Alarm messages via mouse selection.	

| 45. | Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS MOD_CR_CP_HSRY1**
    RAW GROUP=1 TYPE=YELLOW LL=5 | Verify that an event message TBS is displayed, stating that Red HL for mnemonic MOD_CR_CP_HSRY1 has been modified.

Monitor (for one master cycle) the "ALARM" alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is Normal

-Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is Normal

-Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is Normal

-Packet 30 - Mnemonic MOD_CR_CP_HSRY1 is Normal

Notifications without an "ALARM" are received for yellow limit violations.

Notifications with an "ALARM" are received for red violations

NOTE: Acknowledge "ALARM" messages via mouse selection. | |

46.	Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:	Verify that an event message TBS is displayed, stating that Yellow LL for mnemonic MOD_CR_CP_HSRY1 has been modified.	
	ECL> **LIMITS MOD_CR_CP_HSRY1 RAW GROUP=1 TYPE=YELLOW LL=*TBS***	Monitor (for one master cycle) the "ALARM" alphanumeric display and the Event display and verify the following:	
		-Packet 7 - Mnemonic MOD_CR_CP_HSRY1 is YELLOW LOW	
		-Packet 15 - Mnemonic MOD_CR_CP_HSRY1 is Normal	
		-Packet 22 - Mnemonic MOD_CR_CP_HSRY1 is RED HIGH	
		-Packet 30 - Mnemonic MOD_CR_CP_HSRY1 is RED HIGH	
		Notifications without an Alarm are received for yellow limit violations.	
		Notifications with an Alarm are received for red violations.	
		NOTE: Acknowledge Alarm messages via mouse selection.	

| 47. | Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS <GNC_SRST_HKRY1> RAW GROUP=1 TYPE=YELLOW HL=*TBS*** | Verify that an event message TBS is displayed, stating that Yellow HL for mnemonic GNC_SR_ST_HKRY1 has been modified.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic GNC_SR_ST_HKRY1 is YELLOW LOW

-Packet 15 - Mnemonic GNC_SR_ST_HKRY1 YELLOW HIGH

-Packet 22 - Mnemonic GNC_SR_ST_HKRY1 is RED HIGH

-Packet 30 - Mnemonic GNC_SR_ST_HKRY1 is RED HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 48. | **EU Limit Set Selection**

Enable the limit notification messages for telemetry TBS (2) by entering the following in the ECL directive line of the Control window:

ECL> **LIMITS <TBS (2)> MESSAGE=ON** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic EPS_TR_BPC2_A is on.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic EPS_TR_BPC2_A is RED LOW

-Packet 15 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 22 - Mnemonic EPS_TR_BPC2_A is YELLOW HIGH

-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 49. | Select range limit group two for TBS (2) by entering the following in the ECL directive line of the Control window:

ECL> **LIMITS <TBS (2)> SEL=2** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic EPS_TR_BPC2_A is on.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 15 - Mnemonic EPS_TR_BPC2_A is YELLOW HIGH

-Packet 22 - Mnemonic EPS_TR_BPC2_A is RED HIGH

-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 50. | Select range limit group three for TBS (2) by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS <TBS (2)> SEL=3** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic EPS_TR_BPC2_A is on.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic EPS_TR_BPC2_A is RED LOW

-Packet 15 - Mnemonic EPS_TR_BPC2_A is RED LOW

-Packet 22 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 30 - Mnemonic EPS_TR_BPC2_A is YELLOW HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 51. | Select range limit group four for TBS (2) by entering the following in the ECL directive line of the Control window:

ECL> **LIMITS <TBS (2)> SEL=4** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic EPS_TR_BPC2_A is on.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic EPS_TR_BPC2_A is RED LOW

-Packet 15 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 22 - Mnemonic EPS_TR_BPC2_A is RED HIGH

-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 52. | Select range limit group one for TBS (2) by entering the following in the ECL directive line of the Control window:

  ECL> **LIMITS <TBS (2)> SEL=1** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic EPS_TR_BPC2_A is on.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic EPS_TR_BPC2_A is RED LOW

-Packet 15 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 22 - Mnemonic EPS_TR_BPC2_A is YELLOW HIGH

-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

53.	**EU Limit Adjustment**	Verify that an event message TBS is displayed, stating that Red LL for mnemonic EPS_TR_BPC2_A has been modified.	
	Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:	Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:	
	ECL> **LIMITS <TBS (2)> EU GROUP=1 TYPE=RED LL=***TBS*	-Packet 7 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW	
		-Packet 15 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW	
		-Packet 22 - Mnemonic EPS_TR_BPC2_A is YELLOW HIGH	
		-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH	
		Notifications without an Alarm are received for yellow limit violations.	
		Notifications with an Alarm are received for red violations.	
		(The notifications will contain the 5 characteristics mentioned in step 8.)	
		NOTE: Acknowledge Alarm messages via mouse selection.	

| 54. | Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

ECL> **LIMITS <TBS (2)> EU GROUP=1 TYPE=RED HL=*TBS*** | Verify that an event message TBS is displayed, stating that Red HL for mnemonic EPS_TR_BPC2_A has been modified.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 15 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 22 - Mnemonic EPS_TR_BPC2_A is RED HIGH

-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

| 55. | Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS <TBS (2)> EU GROUP=1 TYPE=YELLOW LL=*TBS*** | Verify that an event message TBS is displayed, stating that Yellow LL for mnemonic EPS_TR_BPC2_A has been modified.

Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following:

-Packet 7 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW

-Packet 15 - Mnemonic EPS_TR_BPC2_A is Normal

-Packet 22 - Mnemonic EPS_TR_BPC2_A is RED HIGH

-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH

Notifications without an Alarm are received for yellow limit violations.

Notifications with an Alarm are received for red violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

56.	Modify limit group 1 boundaries by entering the following in the ECL directive line of the Control window:	Verify that an event message TBS is displayed, stating that Yellow HL for mnemonic EPS_TR_BPC2_A has been modified.	
	ECL> **LIMITS <TBS (2)> EU GROUP=1 TYPE=YELLOW HL=*TBS***	Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following:	
		-Packet 7 - Mnemonic EPS_TR_BPC2_A is YELLOW LOW	
		-Packet 15 - Mnemonic EPS_TR_BPC2_A YELLOW HIGH	
		-Packet 22 - Mnemonic EPS_TR_BPC2_A is RED HIGH	
		-Packet 30 - Mnemonic EPS_TR_BPC2_A is RED HIGH	
		Notifications without an Alarm are received for yellow limit violations.	
		Notifications with an Alarm are received for red violations.	
		(The notifications will contain the 5 characteristics mentioned in step 8.)	
		NOTE: Acknowledge Alarm messages via mouse selection.	

57.	**<u>Single Limit Set Adjustment</u>** Enable the limit notification messages for telemetry TBS (3) by entering the following in the ECL directive line of the Control window: ECL> **LIMITS <TBS (3)> MESSAGE=ON**	Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic MOD_CR_CP_HSRY1 is on. Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following: Mnemonic MOD_CR_CP_HSRY1 is RED LOW A notification with an Alarm is received for each of the red limit violations. *(The notification will contain the 5 characteristics mentioned in step 8.)* **NOTE:** Acknowledge Alarm messages via mouse selection.	
58.	Modify the limit values of mnemonic MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window: ECL> **LIMITS <TBS (3)> TYPE=RED LL=TBS**	Verify that an event message TBS is displayed, stating that Red LL for mnemonic MOD_CR_CP_HSRY1 has been modified. Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following: Mnemonic MOD_CR_CP_HSRY1 is YELLOW LOW A notification without an Alarm is received for each of the yellow limit violations. *(The notification will contain the 5 characteristics mentioned in step 8.)*	

59.	Modify the limit values of mnemonic MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window: ECL> **LIMITS <TBS (3)>** **TYPE=YELLOW LL=TBS**	Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic MOD_CR_CP_HSRY1 is on. Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following: Mnemonic MOD_CR_CP_HSRY1 is Normal No notifications for limit violations are received.	
60.	Modify the limit values of mnemonic MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window: ECL> **LIMITS <TBS (3)>** **TYPE=YELLOW LH=TBS**	Verify that an event message TBS is displayed, stating that Yellow HL for mnemonic MOD_CR_CP_HSRY1 has been modified. Monitor (for one master cycle) the Alarm alphanumeric display and the Event display and verify the following: Mnemonic MOD_CR_CP_HSRY1 is YELLOW HIGH A notification without an Alarm is received for each of the yellow limit violations. *(The notification will contain the 5 characteristics mentioned in step 8.)*	

| 61. | Modify the limit values of mnemonic MOD_CR_CP_HSRY1 by entering the following in the ECL directive line of the Control window:

    ECL> **LIMITS <TBS (3)> TYPE=RED HL=TBS** | Verify that an event message TBS is displayed, stating that Limits reporting for mnemonic MOD_CR_CP_HSRY1 is on.

Monitor (for one master cycle) the "TLM-2080B" alphanumeric display and the Event display and verify the following:

Mnemonic MOD_CR_CP_HSRY1 is RED HIGH

A notification with an Alarm is received for each of the red limit violations.

(The notifications will contain the 5 characteristics mentioned in step 8.)

NOTE: Acknowledge Alarm messages via mouse selection. | |

62.	Define a limit sense interval (when a telemetry point exceeds a limit, when the point comes back in limits, and every Nth occurrence) by entering the following in the ECL directive line of the Control window: ECL> **LIMITS <GNC_SRST_HKRY1> FREQUENCY=3**	Verify that an event message TBS is displayed, stating that the limit sense interval for mnemonic GNC_SR_ST_HKRY1 has been modified to every 3rd limit violation. A notification is received for every 3rd change in limit condition for the telemetry TBS (3). Notifications without an Alarm are received for yellow limit violations. Notifications with an Alarm are received for red violations. *(The notifications will contain the 5 characteristics mentioned in step 8.)* **NOTE:** Acknowledge Alarm messages via mouse selection.	
63.	Snap the Events display window every two minutes.	Verify that the event message is displayed every 3rd change in limit violation.	
64.	Stop the telemetry drivers by entering CTRL-C in the telemetry driver windows.		
65.	Log off the user station(s).		
66.	End of test.		

Table 5-11. 2080B-1

	PKT/ LIMIT	PKT/ LIMIT	PKT/ LIMIT	PKT/ LIMIT
TBS 1	15/RED LOW	30/YELLOW LOW	45/YELLOW HIGH	60/RED HIGH
TBS 2	15/RED LOW	30/YELLOW LOW	45/YELLOW HIGH	60/RED HIGH
TBS 3	15/RED LOW	30/RED LOW	45/RED LOW	60/RED LOW
TBS 4	N/A	N/A	N/A	N/A

TLM - 2090B Delta Limits Processing

Test Case No.: TLM 2090B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display pages "Header" and "TLM090B". Previously generated procedure "TLM2090B" used to supply the telemetry driver with values and mnemonics GTNC_SR_FIN_PTCHERR1, COM_PR_SBT1_FWD_RF, CDH_SR_STBY_CONV2 (no delta limits defined), MIS_IR_CAMERA_DF28V, MIS_IR_CAMERA_AA28V (EU converted with delta limits defined) and COM_BR_HSDLTA, MOD_CR_CP_HSRY1, CDH_CR_SBDLTA2 (raw mnemonics with delta limits defined).

Test Case Description: This test is designed to verify the ability to delta limit check telemetry parameters during the decommutation process based on delta limits definitions in the operational PDB and report on delta limit violations via event message and alphanumeric page display flag fields.

Following sign-on, and initiation of the I&T database as the operational database and initialization of a real-time string in support of the AM-1 spacecraft, alphanumeric display pages and the real-time events page are invoked. The telemetry data driver is initiated, broadcasting housekeeping telemetry onto the FOS LAN. Delta limit conditions are simulated, alphanumeric and event pages are snapped at specific periods and compared against scripted delta limit conditions to determine accuracy of delta limits reporting.

Success Criteria: This test is considered successful when all delta limit violation flags as seen on alphanumeric telemetry displays match raw/EU delta limit definitions as defined in the AM-1 PDB. Delta limit violation messages are displayed for each occurrence of a delta limit violation by any of the decommutated parameters valid for the decommutated telemetry stream/format. All parameters decommutated from bad quality data packets are not delta limit checked.

Step Id	Action	Expected Result/Output	Pass/ Fail

1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	
2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	Connect to a real-time operational string, to accept Housekeeping data, by entering the following in the ECL directive line of the Control window: ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	The following message will appear on the screen: "Successfully connected to string 100".	

8.	At the user station, display the EDU "Header" alphanumeric page which displays telemetry header field values by entering the following in the ECL directives line of the Control window: ECL>**PAGE Header**	Verify the Header window appears at the user station and contains the following fields: -Static flags for all descriptors -Spacecraft time (SDU_SCTIME) -Data source (spacecraft ID) (EDS_SCID) -Quality indicator (EDS_QUALITY) -APID number (SDU_PCKT_APID) -Packet sequence count (SDU_PACKET_SEQ) -Header ID (SDU_SEC_HEADER) -Packet length count (SDU_PCKT_LENGTH) -Mstr. Cycle Count (EDS_CYCLE_COUNT) -Header Length (EDS_CCSDS_HDR_LENGTH) -CCSDC Version (SDU_CCSDS_VER) Verify the Delta display appears at the user station and contains the following: Mnemonic descriptors -GNC_SR_ST_HKRY1 -COM_PR_SBT1_FWD_RF -CDH_BR_SBDELTA2 -GNC_SR_FIN_PTCHERR1 Static flags for all descriptors NODATA flags for all descriptors	

9.	At the user station, display the "TLM2090B" alphanumeric page which displays telemetry mnemonics which will be used to verify delta limit violations by entering the following in the ECL directives line of the Control window: ECL> **PAGE TLM2090B**	Verify the "TLM2090B" display appears at the user station and contains the following: -GNC_SR_FIN_PTCHERR1 -MIS_IR_CAMERA_DF28V -MIS_IR_CAMERA_AA28V -COM_BR_HSDLTA1 -COM_PR_SBT1_FWD_RF -MOD_CR_CP_HSRY1 -CDH_CR_CP_HSRY1 -CDH_CR_SBDLTA2 -CDH_SR_STBY_CONV2 Static flags for all descriptors are present	
10.	Move the cursor over the "Header" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
13.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	

15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
16.	Move the cursor over the "TLM2090B" alphanumeric page and repeat steps 11-15.	The "Data Source Selector" window will disappear.	
17.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgPackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window.	
18.	Take ground control of string 100 by entering the following in the ECL directive line of the Control window: ECL> **TAKE GROUNDCONTROL STRING=100**	Verify the following event message appears in the Event Display: *"Ground Control Authority has changed from fostest2 for string to userstationX"*	
19.	Disable the limit notificatin messages and alarms for all parameters by entering the following in the ECL directive line of the Control window: ECL> **LIMITS OFF STRING=100**	Verify the following event message appears in the Event Display: *"User Station X Successfully reconfigured string processes."*	

20.	To define the port to use for the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20001 APID=1**	The I.P. address and port should appear in the X-term window that the packet generator is running.	
21.	Start the previously built procedure which supplies the telemetry driver with values for mnemonics by entering the following in the ECL directive line of the Control window: ECL>**START TLM2090B**	The event message stating that the procedure controller has finished processing procedure TLM2090B will appear in the Event Display.	
22.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG STARTDATA APID=1 COUNT=-1**	Verify (after one master cycle) that each mnemonic's: -GNC_SR_FIN_PTCHERR1 -MIS_IR_CAMERA_DF28V -MIS_IR_CAMERA_AA28V -COM_BR_HSDLTA1 -COM_PR_SBT1_FWD_RF -MOD_CR_CP_HSRY1 -CDH_CR_CP_HSRY1 -CDH_CR_SBDLTA2 -CDH_SR_STBY_CONV2 "STATIC" flag indicators no longer appear on the display page and that the mnemonics listed above are marked as active.	

23.	View the "Header" page and when packet 5 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that all mnemonics are marked as active. Verify that no Delta limit violations have occured.	
24.	View the "Header" page and when packet 9 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: MIS_IR_CAMERA_AA28V Delta limit voilation at 117: (delta 100)"* appears in the event display window. Verify that the mnemonic is marked with a "D" on the alphanumeric display page "TLM2090B".	
25.	View the "Header" page and when packet 12 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: Packet failed Reed-Solomon verification"* Mnemonics GNC_FIN_PTCHERR1 and MIS_CAMERA_DF28V should be marked with a "Q" for questionable quality. No limit checking should be done on this packet.	

26.	View the "Header" page and when packet 33 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: MIS_IR_CAMERA_AA28V Delta limit voilation at 322: (delta 100)"* appears in the event display window. Verify that the mnemonic is marked with a "D" on the alphanumeric display page "TLM2090B".	
27.	View the "Header" page and when packet 37 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that no delta limit violations have occurred.	
28.	View the "Header" page and when packet 41 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: MIS_IR_CAMERA_AA28V Delta limit voilation at 16: (delta 100)"* appears in the event display window. Verify that the mnemonic is marked with a "D" on the alphanumeric display page "TLM2090B".	

29.	View the "Header" page and when packet 44 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: MIS_IR_CAMERA_DF28V Delta limit voilation at 300: (delta 100)"* appears in the event display window. Verify that the mnemonic is marked with a "D" on the alphanumeric display page "TLM2090B".	
30.	View the "Header" page and when packet 52 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: MIS_IR_CAMERA_DF28V Delta limit voilation at 90: (delta 100)"* appears in the event display window. Verify that the mnemonic is marked with a "D" on the alphanumeric display page "TLM2090B".	
31.	Stop the telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=1**	In the X-term window responsible for the multicast of Housekeeping telemetry (the packet generator), the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2030B" has stopped updating and that all mnemonics on the alphanumeric display page have become static.	

32.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	
33.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	
34.	Invoke the EDOS telemetry driver for the multicast of Health and Safety telemetry packets for processing on the I channel. ECL>**PG CONFIG HOST=225.2.7.000 PORT=20002 APID=2** ECL>**PG STARTDATA APID=2 COUNT=-1**	Verify (after one master cycle) that each Health and Safety mnemonic's "STATIC" flag indicators no longer appear. Verify that mnemonics that are not defined as Health & Safety mnemonics are still flagged as "STATIC".	
35.	View the "Header" page and when packet 7 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that no delta limit violations have occurred.	

36.	View the "Header" page and when packet 14 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: MOD_CR_CP_HSRY1 Delta limit voilation at 188: (delta 15)"* *"I Decom: COM_BR_HSDLTA1 Delta limit voilation at 60: (delta 15)"* appears in the event display window. Verify that the mnemonics are marked with a "D" on the alphanumeric display page "TLM2090B".	
37.	View the "Header" page and when packet 20 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that no delta limit violations have occurred.	

38.	View the "Header" page and when packet 24 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: MOD_CR_CP_HSRY1 Delta limit voilation at 22: (delta 15)"* *"I Decom: COM_BR_HSDLTA1 Delta limit voilation at 12: (delta 15)"* appears in the event display window. Verify that the mnemonics are marked with a "D" on the alphanumeric display page "TLM2090B".	
39.	View the "Header" page and when packet 31 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that no delta limit violations have occurred.	
40.	Stop the telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=2**	In the X-term window responsible for the multicast of Housekeeping telemetry (the packet generator), the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2030B" has stopped updating and that all mnemonics on the alphanumeric display page have become static.	
41.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	

42.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	
43.	Invoke the EDOS telemetry driver for the multicast of Health and Safety telemetry packets for processing on the I channel. ECL>**PG CONFIG HOST=225.2.7.000 PORT=20004 APID=5** ECL>**PG STARTDATA APID=5 COUNT=-1**	Verify (after one master cycle) that each Standby mnemonic's "STATIC" flag indicators no longer appears on the display page and that the mnemonics listed below are marked as active: Verify that mnemonics that are not defined as Standby mnemonics are still flagged as "STATIC".	
44.	View the "Header" page and when packet 7 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that no delta limit violations have occurred.	
45.	View the "Header" page and when packet 14 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: CDH_CR_SBDLTA2 Delta limit voilation at 30: (delta 10)"* appears in the event display window. Verify that the mnemonics are marked with a "D" on the alphanumeric display page "TLM2090B".	

46.	View the "Header" page and when packet 20 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that no delta limit violations have occurred.	
47.	View the "Header" page and when packet 26 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that the following event message: *"I Decom: CDH_CR_SBDLTA2 Delta limit voilation at 10: (delta 10)"* appears in the event display window. Verify that the mnemonics are marked with a "D" on the alphanumeric display page "TLM2090B".	
48.	View the "Header" page and when packet 31 is sent, snap the telemetry pages "TLM2090B' and "Header" at the user station by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis. Verify that no delta limit violations have occurred.	
49.	**Delta Limit Modification** Modify the delta limit for mnemonic CDH_CR_SBDLTA2 by entering the following in the ECL directive line of the Control window: ECL> **LIMITS CDH_CR_SBDLTA2 DELTA=200 STRING=100**	Verify that the event message stating that the Delta limit for mnemonic CDH_CR_SBDLTA2 has been modified to equal 200 appears in the event display window.	

50.	Monitor (for one Master cycle) the alphanumeric display page "TLM2090B" and verify that the mnemonic CDH_CR_SBDLTA2 does not incur a delta limit voilation.	No delta limit messages will appear for the mnemonic CDH_CR_SBDLTA2 in the event display window.	
51.	Attempt to modify the delta limit for mnemonic CDH_SR_STBY_CONV2 by entering the following in the ECL directive line of the Control window: ECL> **LIMITS CDH_SR_STBY_CONV2 DELTA=10 STRING=100**	Verify that the event message stating that there are no delta limits defined for mnemonic CDH_SR_STBY_CONV2 appears in the event display window.	
52.	**Limit Sense Interval Modification** Modify the limit sense interval of the mnemonic CDH_CR_SBDLTA2 by entering the following in the ECL directive line of the Control window: ECL> **LIMITS CDH_CR_SBDLTA2 FREQUENCY=2**	Monitor the Event display and the alphanumeric display page "TLM2090B" for three (3) Master cycles, and verify that the following message is the only Delta Limit Violation message that appears in the event display: *"I Decom: CDH_CR_SBDLTA2 Delta limit violation at 10(delta 10)."* Verify that the mnemonic is marked with a "D" on the alphanumeric display page "TLM2090B" only at packet 26 during each Master cycle.	
53.	Stop the telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=5**	In the X-term window responsible for the multicast of Housekeeping telemetry (the packet generator), the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2030B" has stopped updating and that all mnemonics on the alphanumeric display page have become static.	

54.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	
55.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	
56.	Log off the user station(s).		
57.	End of test.		

TLM-2150B Real-time Data Dropout

Test Case No.: TLM 2150B

Test Title: Real-time Data Dropout

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display pages "Header" and "TLM2150B". A pre-built procedure (TLM2050B) generates missing packets.

Test Description: This test is designed to verify the ability to mark individual telemetry parameters as "static" when one of two conditions exist: (1) The telemetry stream has not been received for a 5 second period, or (2) data has not been received for any given parameter within a spacecraft master cycle period.

Following sign-on, alphanumeric telemetry pages which include visually associate parameter decom values are invoked at EOC user stations. The telemetry data driver is initiated, broadcasting housekeeping telemetry onto the FOS LAN at a rate of 16 Kbps. Data TLM-2150BHS periods are simulated, ranging from one to multiple packets. As telemetry packets are received and EU conversions are displayed, alphanumeric displays are printed. Static indicators associated with each parameter are compared against TLM-2150BHS periods in order to verify timely flagging of static indicators for each parameter.

Success Criteria: This test is considered successful when all telemetry parameters are marked as "static" and "nodata" upon initialization; all parameters are marked as static upon data TLM-2150BHS time-out period (i.e. 5 seconds); any mnemonic not being supplied with data values for any time period greater than one master cycle is marked as STATIC; event messages are received upon missing packet and missing major cycle conditions.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	

2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
6.	Click the mouse on the "OK" button below the selection box.	The "Event Display" page appears on the screen.	
7.	Connect to a real-time operational string, to accept Health & Safety data, by entering the following in the ECL directive line of the Control window: ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

| 8. | At the user station, display the EDU Header alphanumeric page which displays telemetry header field values by entering the following:

ECL> **PAGE Header** | Verify the Header window appears at the user station and contains the following fields:

-Static flags for all descriptors

-Spacecraft time (SDU_SCTIME)

-Data source (spacecraft ID) (EDS_SCID)

-Quality indicator (EDS_QUALITY)

-APID number (SDU_PCKT_APID)

-Packet sequence count SDU_PACKET_SEQ)

-Header ID (SDU_SEC_HEADER)

-Packet length count (SDU_PCKT_LENGTH)

-Mstr. Cycle Count (EDS_CYCLE_COUNT)

-Header Length (EDS_CCSDS_HDR_LENGTH)

-CCSDC Version (SDU_CCSDS_VER)

"STATIC" flags should be present for all descriptors. | |

9.	At the user station display the "TLM-2150B" alphanumeric page, which displays Standby mnemonic values, by entering the following: ECL>**PAGE TLM2150B**	Verify the "TLM2150B" display appears at the user station and contains the following: -COM_IR_SBT2_XMTR -MOD_CR_CPB_EEP_WRE_S -COM_PR_SBT1_FWD_RF -GNC_SR_FIN_PTCHERR1 -COM_SR_SBT2_LO1_ERR -GNC_BR_ANG_MODE_2 -CDH_NR_SCC2_VALDAT -CDH_CR_ACT_RPT_TYP -CDH_NR_NXT_FRSEQ -SMS_SR_HGA_DS_POTA "STATIC" flags for all descriptors **NOTE:** Display page includes mnemonics in packets 1 or 2.	
10.	Move the cursor over the "Header" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
13.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	

14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
16.	Move the cursor over the "TLM2150B" alphanumeric page and repeat steps 11-15.	The "Data Source Selector" window will disappear.	
17.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing on the I channel. In a new terminal window, enter the following: %: **cd /fosb/test/am1/scripts/setup** %: **setenv SCRIPT UserStation** %: **source FosEnvVars** %: **cd /fosb/test/am1/bin/sun_sparc_5-5** %: **FtPgPackGen**	The message "Packet Generator is ready to receive directives" should appear in the x-term window.	
18.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20001 APID=1** ECL> **PG DELAY MILLS=7000 APID=1** ECL>**PG STARTDATA APID=1 COUNT=5**	Verify, after the first two packets are sent, that each mnemonic's "STATIC" flag indicators no longer appear on the display pages and that the mnemonics are marked as active.	

19.	Monitor the "Event Display" page and the Control window. Click the mouse on the red "ACK" button in the Control window after each packet is sent.	Verify that the following message appears on the "Global Events Display" page and in the events window of the Control window after each packet is sent: *"I Decom: Timeout Receiving Data* *Timeout is 5 seconds"* Verify that the "ACK" button becomes deactivated and that the messages begin to scroll again in the Control window.	
20.	Start the procedure "TLM2150B" by entering the following in the ECL directives line of the Control window: ECL> **START TLM2150B**	Verify in the "Event Display" that an event message appears stating that the procedure controller is finished processing TLM2150B.	
21.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20002 APID=2** ECL>**PG DELAY MILLS=1000** ECL>**PG STARTDATA APID=2 COUNT=-1**	Verify, after the first two packets are sent, that each mnemonic's "STATIC" flag indicators no longer appear on the display pages and that the mnemonics are marked as active. Verify (at packet 22), in the event display, that the following message appears: *"I CCSDS packet sequence error 1 packet(s) missing between 22 and 24"* (indicating that a missing packet was detected).	

22.	Stop the telemetry driver by entering the following in the ECL directives line of the Control window: ECL> **PG STOPDATA APID=2**	Telemetry stops flowing. Event message appears in terminal window of telemetry driver stating that data has stopped. Verify that all mnemonics on telemetry pages "TLM2150B" and "Header" are marked as static.	
23.	To start the telemetry driver, enter the following in the ECL directive line of the Control window: ECL>**PG CONFIG HOST=225.2.7.000 PORT=20004 APID=5** ECL>**PG STARTDATA APID=5 COUNT=-1**	Verify (at packets 13,14, and 15), in the event display, that the following message appears: "*%CCSDS packet sequence error 3 packet(s) missing between 12 and 16*" (indicating that 3 missing packets were detected).	
24.	Stop the telemetry driver by entering the following in the ECL directives line of the Control window: ECL> **PG STOPDATA APID=5**	Telemetry stops flowing. Event message appears in terminal window of telemetry driver stating that data has stopped. Verify that all mnemonics on telemetry pages "TLM2150B" and "Header" are marked as static.	
25.	Log off the user station(s).		
26.	End of test.		

Real-Time Telemetry Archive

Test Case No.: TLM 2160B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display page "Header". HKValue file, which scripts a start-time for the telemetry driver "packGen". HKValue, HSValue, and SBValue files which will script the start times.

Test Description: This test is designed to verify the ability to archive Housekeeping and Health & Safety and Standby packets simultaneously and provide unique catalog entries for all archived telemetry.

Following sign-on, alphanumeric telemetry pages which include parameter and associated parameter Decom value displays are invoked at the user station. The telemetry data driver is initiated, broadcasting Housekeeping, Health & Safety and Standby telemetry onto the FOS LAN, each stream broadcast in sequential time order. Access to the archive will be performed during and after the archive process to ensure proper cataloging of received data. Test steps will then be provided to display, dump and compare archive content to scripted data in order to verify archive data integrity.

Success Criteria: The test is considered successful when the data archive directory files contain proper S/C and configuration naming conventions. Analysis of archived telemetry data files reveals no data integrity loss during the archive or merge processes.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	
2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	

3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	Bring up the Event Display. Select 'Event_Display' from the Control window tools menu.	The 'Event Display' is up on the FOT User Station.	
5.	Connect to a real-time operational string, to accept Health & Safety data, by entering the following in the ECL directive line of the Control window: ECL>**STRING CONNECT STRING=100 CONFIG= MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

6.	At the user station, display the EDU Header and alphanumeric page which displays telemetry header field values by entering the following: ECL>**P Header**	Verify the Header window appears at the user station and contains the following fields: -Mnemonic descriptors -Static flags for all descriptors -NODATA flags for all descriptors -Spacecraft time (SDU_SCTIME) -Data source (spacecraft ID) (EDS_SCID) -Quality indicator (EDS_QUALITY) -APID number (SDU_PCKT_APID) -Packet sequence count -SDU_PACKET_SEQ) -Packet length count (SDU_PCKT_LENGTH) -CCSDC Version (SDU_CCSDS_VER)	
7.	**Real-time Housekeeping Archive (Q-channel)** Click the mouse on the "Tools" button.	The Tool Selection dialog box appears.	
8.	Select "Data Source Switcher" from the Tool Selection dialog box.	The "Data Source Switcher" window will appear on the screen.	
9.	View the "Established Connections" box and select a string identified as Housekeeping on the Q channel.	The Q channel string will become highlighted.	
10.	Click the mouse on the "Switch Connection" button.	An event message TBS will appear in the Event Display window stating that the user is now connected to the Q channel string for Housekeeping.	

| 11. | Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing.

In a new terminal window, enter the following:

    %: **cd /fos/test/am1/scripts/setup**

    %: **source packGenVars**

    %: **cd /fos/test/am1/bin/sun_sparc_5-5**

    %: **packGen**

Enter tlm type: **am1-hk**

At the packGen prompt enter the following:

    IP address = **224.2.7.00**

    Port number = **20010**

    Number of packets to send: **-1**

Packet delay in milliseconds: **8000**

Note: *The HKValue file will be scripted to begin at TimeTBS(1).* | Verify that the following message appears on the screen:

"%s Decom: Ready to receive telemetry packets." | |
| 12. | Run the packet generator for X minutes. | Verify (after one master cycle) that each mnemonic's "NODATA" or "STATIC flag indicators no longer appear on the display page and that the mnemonics are marked as active. | |

13.	Verify, through Sybase (fos_tlm_cata) and file_meta that data file HK(X) exists.	Verify that the filename contains channel, telemetry type, and correct time stamp. Verify that the start_time, stop_time, start_packet, stop_packet, space_craft_id, delta_type and channel all match the values specified in table TLM2160B.	
14.	Stop the telemetry driver by entering CTRL-C in the console window where the Telemetry driver was running.		
15.	**Real-time Housekeeping Archive (I-channel)** View the "Established Connections" box and select a string identified as Housekeeping on the I channel.	The I channel string will become highlighted	
16.	Click the mouse on the "Switch Connection" button.	An event message TBS will appear in the Event Display window stating that the user is now connected to the I channel string for Housekeeping.	

17.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fos/test/am1/scripts/setup** %: **source packGenVars** %: **cd /fos/test/am1/bin/sun_sparc_5-5** %: **packGen** Enter tlm type: **am1-hk** At the packGen prompt enter the following: IP address = **224.2.7.00** Port number = **20000** Number of packets to send: **-1** Packet delay in milliseconds: **8000** **Note:** *The HKValue file will be scripted to begin at TimeTBS(1).*	Verify that the following message appears on the screen: "%s Decom: Ready to receive telemetry packets."	
18.	When the packet generator has sent 500 packets, verify in the fosb/test/am1/tlmarchive directory and through Sybase (tlm cata) and (file meta) that the data file HKI exists	Verify, using Hkreader and Time Conversion that the filename contains channel, telemetry type, and the correct time stamp (should be current time)	

19.	**Archive Health and Safety I Channel** Tostart the telemetry driver for the Multicast Health & Safety telemetry packets for processing on the I channel, enter the following in the ECL directive line of the Control window: ECL > **PG CONFIG HOST-225.2.7.000 PORT =2002** ECL > **PG STARTDATA APID=2 COUNT=400**	Verify that each mnemonic's static or no data flag indicators will no longer appear on the display page and the mnemonics listed above are marked as active.	
20.	Monitor the Header alphanumeric page for the duration of the packets.	Verify that the SDU_PACKET_SEQ continues to increment by one with each packet sent by the packet generator.	
21.	When the packet generator has sent 500 packets, verify in the fosb/test/am1/tlmarchive directory and through Sybase (tlm cata) and (file meta) that the data file HSI exists	Verify , using Hkreader and Time Conversion that the filename contains channel, telemetry type, and the correct time stamp (should be current time)	
22.	Click the mouse on the "Switch Connection" button.	An event message TBS will appear in the Event Display window stating that the user is now connected to the Q channel string for Health & Safety.	

23.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing.
	
	In a new terminal window, enter the following:
	
	    %: **cd /fos/test/am1/scripts/setup**
	
	    %: **source packGenVars**
	
	    %: **cd /fos/test/am1/bin/sun_sparc_5-5**
	
	    %: **packGen**
	
	Enter tlm type: **am1-hs**
	
	At the packGen prompt enter the following:
	
	IP address = **224.2.7.00**
	
	Port number = **20011**
	
	Number of packets to send: **-1**
	
	Packet delay in milliseconds: **8000**
	
	Note: *The HSValue file will be scripted to begin at TimeTBS(1).*
		Verify that the following message appears on the screen:
		
		"%s Decom: Ready to receive telemetry packets."	

24.	Run the packet generator for X minutes.	Verify (after one master cycle) that each mnemonic's "NODATA" or "STATIC flag indicators no longer appear on the display page and that the mnemonics are marked as active.	
25.	Stop the telemetry driver by entering CTRL-C in the telemetry driver window.	Verify that telemetry stops flowing (packets are no longer being received) in the Event Display window.	

26.	Verify, through Sybase (fos_tlm_cata) and file_meta that data file HS(X) exists.	Verify that the filename contains channel, telemetry type, and correct time stamp. Verify that the start_time, stop_time, start_packet, stop_packet, space_craft_id, delta_type and channel all match the values specified in table TLM2160B.	
27.	**Real-time Health & Safety Archive (I-channel)** View the "Established Connections" box and select a string identified as Health & Safety on the I channel.	The I channel string will become highlighted	
28.	Click the mouse on the "Switch Connection" button.	An event message TBS will appear in the Event Display window stating that the user is now connected to the I channel string for Health & Safety.	

29.	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing.
	
	In a new terminal window, enter the following:
	
	    %: **cd /fos/test/am1/scripts/setup**
	
	    %: **source packGenVars**
	
	    %: **cd /fos/test/am1/bin/sun_sparc_5-5**
	
	    %: **packGen**
	
	Enter tlm type: **am1-hs**
	
	At the packGen prompt enter the following:
	
	    IP address = **224.2.7.00**
	
	    Port number = **20001**
	
	    Number of packets to send: **-1**
	
	    Packet delay in milliseconds: **8000**
	
	Note: *The HSValue file will be scripted to begin at TimeTBS(1).*
		Verify that the following message appears on the screen:
		
		"%s Decom: Ready to receive telemetry packets."	

30.	Run the packet generator for X minutes.	Verify (after one master cycle) that each mnemonic's "NODATA" or "STATIC flag indicators no longer appear on the display page and that the mnemonics are marked as active.	
31.	Stop the telemetry driver by entering CTRL-C in the telemetry driver window.	Verify that telemetry stops flowing (packets are no longer being received) in the Event Display window.	

32.	Verify, through Sybase (fos_tlm_cata) and file_meta that data file HS(Y) exists.	Verify that the filename contains channel, telemetry type, and correct time stamp.	
		Verify that the start_time, stop_time, start_packet, stop_packet, space_craft_id, delta_type and channel all match the values specified in table TLM2160B.	
33.	**<u>Real-time Standby Archive (Q-channel)</u>** View the "Established Connections" box and select a string identified as Standby on the Q channel.	The Q channel string will become highlighted	
34.	Click the mouse on the "Switch Connection" button.	An event message TBS will appear in the Event Display window stating that the user is now connected to the Q channel string for Standby.	

35.	Invoke the EDOS telemetry driver for the multicast of Standby telemetry packets for processing.
	
	In a new terminal window, enter the following:
	
	    %: **cd /fos/test/am1/scripts/setup**
	
	    %: **source packGenVars**
	
	    %: **cd /fos/test/am1/bin/sun_sparc_5-5**
	
	    %: **packGen**
	
	Enter tlm type: **am1-standby**
	
	At the packGen prompt enter the following:
	
	IP address = **224.2.7.00**
	
	Port number = **20013**
	
	Number of packets to send: **-1**
	
	Packet delay in milliseconds: **8000**
	
	Note: *The SBValue file will be scripted to begin at TimeTBS(1).*
		Verify that the following message appears on the screen:
		
		"%s Decom: Ready to receive telemetry packets."	

36.	Run the packet generator for X minutes.	Verify (after one master cycle) that each mnemonic's "NODATA" or "STATIC flag indicators no longer appear on the display page and that the mnemonics are marked as active.	

37.	Verify, through Sybase (fos_tlm_cata) and file_meta that data file SB(X) exists.	Verify that the filename contains channel, telemetry type, and correct time stamp. Verify that the start_time, stop_time, start_packet, stop_packet, space_craft_id, delta_type and channel all match the values specified in table TLM2160B.	
38.	Stop the telemetry driver by entering CTRL-C in the telemetry driver window.	Verify that telemetry stops flowing (packets are no longer being received) in the Event Display window.	
39.	**Real-time Standby Archive (I-channel)** View the "Established Connections" box and select a string identified as Standby on the I channel.	The I channel string will become highlighted	
40.	Click the mouse on the "Switch Connection" button.	An event message TBS will appear in the Event Display window stating that the user is now connected to the I channel string for Standby.	

41.	Invoke the EDOS telemetry driver for the multicast of Standby telemetry packets for processing. In a new terminal window, enter the following: %: **cd /fos/test/am1/scripts/setup** %: **source packGenVars** %: **cd /fos/test/am1/bin/sun_sparc_5-5** %: **packGen** Enter tlm type: **am1-standby** At the packGen prompt enter the following: IP address = **224.2.7.00** Port number = **20003** Number of packets to send: **-1** Packet delay in milliseconds: **8000** **Note:** *The SBValue file will be scripted to begin at TimeTBS(1).*	Verify that the following message appears on the screen: "%s Decom: Ready to receive telemetry packets."	
42.	Run the packet generator for X minutes.	Verify (after one master cycle) that each mnemonic's "NODATA" and "STATIC flag indicators no longer appear on the display page and that the mnemonics are marked as active.	

43.	Verify, through Sybase (fos_tlm_cata) and file_meta that data file SB(Y) exists.	Verify that the filename contains channel, telemetry type, and correct time stamp. Verify that the start_time, stop_time, start_packet, stop_packet, space_craft_id, delta_type and channel all match the values specified in table TLM2160B.	
44.	Stop the telemetry driver by entering CTRL-C in the telemetry driver window.	Verify that telemetry stops flowing (packets are no longer being received) in the Event Display window.	
45.	Use the archive tool TBS(Tool) to view files and ensure that there is no data duplication.	There will be no data duplication in any of the Housekeeping, Health & Safety or Standby archived files.	
46.	Via offline analysis, verify through a Hex-dump that no data is duplicated.	There will be no data duplication in any of the Housekeeping, Health & Safety or Standby archived files.	
47.	Log off the user station(s).		
48.	End of test.		

TLM-2170B - Simultaneous I and Q Channel Data Receipt

Test Case No.: TLM 2170B

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "FtPgPackGen" supporting multiple APIDs, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display page "Header", "TLM2010B" and "TLM2030B". Validated I & T database with conversion information defined. Alphanumeric pages are displayed, verifying the receipt of data.

Test Description: This test is designed to verify the FOS' capability of providing telemetry processing of telemetry streams received on the I and Q channels simultaneously. The user will be using a driver called "FtPgPackGen" to flow data on both channels. The updating display pages will provide verification of simultaneous data receipt.

Following sign-on, two alphanumeric telemetry pages which include parameter and associated parameter Decom value displays are invoked at the user station. One page will monitor the I channel and the other page will monitor the Q channel. The telemetry driver is initiated, broadcasting Housekeeping, Health & Safety and Standby telemetry simultaneously on the I and Q channels. The pages will update simultaneously with each type of data.

Success Criteria: The test is considered successful when telemetry decom values are displayed on the alphanumeric display pages; telemetry processing on the I and Q channels is not degraded as a result of simultaneous telemetry processing; alphanumeric pages support both I and Q channel telemetry processing and display information.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B – FOS Server Startup.	Data Server processes are running.	
2.	Start the Real-Time Server. Reference Test Case SYS2000B – FOS Server Startup.	Real-Time Server processes are running.	

3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication. (This User Station will be referenced to as "User Station A")	The FOT User Station is running and the 'Control window' is displayed.	
4.	Click the mouse on the "Tools" button n the Control window.	The "Tool Selection" Dialog Box will appear on the screen.	
5.	Select "Event_Display-Global" from the Tool Selection Dialog box.	The "Event_Display-Global" becomes highlighted.	
6.	Click the mouse on the "OK" button below the selection box.	The "Global Event Display" page appears on the screen.	
7.	Connect to a real-time operational string, to accept data, by entering the following in the ECL directive line of the Control window: ECL> **STRING CONNECT STRING=100 CONFIG=MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	
8.	Iconify the "Status" window.	The "Status" window will become an icon in the upper right corner of the user station screen.	

| 9. | At the user station, display the "TLM2010B" alphanumeric page, which displays Housekeeping mnemonic values, by entering the following in the ECL directive line of the Control window:

    ECL> **PAGE TLM2010B** | Verify the "TLM2010B" display appears at the user station and contains the following:

Housekeeping Data:

-CDH_NR_ACT_NXT_FRSEQ

-FS2_SS_MSMT_UP_CNT

-EPS_TR_SAA_MST_MTRA

-FS1_SS_IACSPW_1

-CDH_BR_SSR1_SCRPLY

-GNC_BR_ANG_MODE_2

-COM_BR_SBT2_PN_LOCK

-CDH_SR_SCT_OP_STATE

CERES Data:

-CEA_NS_PKTCOUNT

-CEA_NS_PKTTIME_1

-CEA_NS_PKTTIME_2

-CEA_CS_SWSTPTT

-CEA_NS_AZSTCNT

-CEA_BS_SOLWARN

-CEA_BS_MAMACTS

 "STATIC" flags should be present for all descriptors. | |

10.	Move the cursor over the "TLM2010B" alphanumeric page.		
11.	Click the mouse on the right button.		
12.	Choose "Data Source Selector" from the menu.	The "Data Source Switcher" window will appear.	
13.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
14.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
15.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	

16.	At the user station, display the "TLM2170B" alphanumeric page, which displays Health & Safety, Standby mnemonic values, by entering the following in the ECL directive line of the Control window: ECL> **PAGE TLM2170B**	Verify the "TLM2170B" alphanumeric display appears at the user station and contains the following: Housekeeping Mnemonics: -GNC_SR_FIN_PTCHERR1 -MIS_IR_CAMERA_AN28V -AST_VR_M_MPSB_OUT Health and Safety Mnemonics: -GNC_IR_IRUB_MOTOR -GNC_SR_FIN_ROLLER1 -COM_IR_SSPA1 Standby Mnemonics: -CDH_BR_STBY_CONV1 -CDH_NR_STBY_CONV3 -CDH_SR_STBY_CONV4 "STATIC" flags should be present for all descriptors.	
17.	Move the cursor over the "TLM2170B" alphanumeric page.		
18.	Click the mouse on the right button.		
19.	Choose "Data Source Selector" from the menu.	The "Data Source Switcher" window will appear.	

20.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
21.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
22.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
23.	Log onto another User Station (which will be referred to as "User Station B".)		

24.	**At User Station B**
	
	(herein referred to as Station B)
	
	Invoke the EDOS telemetry driver for the multicast of Housekeeping telemetry packets for processing on the I channel.
	
	 In a new terminal window, enter the following:
	
	    %: **cd /fosb/test/am1/scripts/setup**
	
	    %: **setenv SCRIPT UserStation**
	
	    %: **source FosEnvVars**
	
	    %: **cd /fosb/test/am1/bin/sun_sparc_5-5**
	
	    %: **FtPgPackGen**
		The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

25.	To start the telemetry driver, enter the following in the ECL directive line of the Control window:
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20001 APID=1**
	
	    ECL>**PG STARTDATA APID=1 COUNT=-1**
		Verify, after one master cycle, that all mnemonic's "STATIC" flags on both alphanumeric pages have disappeared.	

26.	**At Station A** (herein referred to as Station A) Move the cursor over the "TLM2170B" alphanumeric page.		
27.	Click the mouse on the right button.		
28.	Choose "Data Source Selector" from the menu.	The "Data Source Switcher" window will appear.	
29.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the Q channel on the right.	Both rows will become highlighted.	
30.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box. Mnemonics "STATIC" flags will appear.	
31.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	

32.	**At User Station B**
	
	Invoke the EDOS telemetry driver for the multicast of Health & Safety telemetry packets for processing on the Q channel.
	
	In a new terminal window, enter the following:
	
	    %: **cd /fosb/test/am1/scripts/setup**
	
	    %: **setenv SCRIPT UserStation**
	
	    %: **source FosEnvVars**
	
	    %: **cd /fosb/test/am1/bin/sun_sparc_5-5**
	
	    %: **FtPgPackGen**
		The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

33.	To start the second telemetry driver, enter the following in the ECL directive line of the Control window:
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20011 APID=2**
	
	    ECL>**PG STARTDATA APID=2 COUNT=-1**
		At User Station A, verify, after one master cycle, that the Health and Safety mnemonic's "STATIC" flags on the alphanumeric page "TLM2170B" have disappeared.	

34.	Allow the packet generator to run for approximately 5 minutes. At User Station A, verify that both pages continue to update as Housekeeping data flows on the I channel and Health & Safety data flows on the Q channel.	All Housekeeping and Health & Safety mnemonics are marked as active.	

35.	**At User Station B** Stop the Health and Safety telemetry driver on the Q channel by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=2**	In the X-term window containing the Health and Safety telemetry driver, the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2170B" has stopped updating and all mnemonics on that the alphanumeric display page have become static. **Note:** The alphanumeric page "TLM2010B" should continue to update.	
36.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "Q Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	
37.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	

38.	**At User Station B**
	
	Invoke the EDOS telemetry driver for the multicast of Standby telemetry packets for processing on the Q channel.
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20013 APID=5**
	
	    ECL>**PG STARTDATA APID=5 COUNT=-1**
		At User Station A, verify, after one master cycle, that the Standby telemetry mnemonic's "STATIC" flags on the alphanumeric page "TLM2170B" have disappeared.	

39.	**At User Station A** Allow the packet generator to run for approximately 5 minutes. Verify that both alphanumeric display pages, "TLM2170B" and "TLM2010B" continue to update as Housekeeping data flows on the I channel and Standby data flows on the Q channel.	All Housekeeping and Standby mnemonics are marked as active.	
40.	**At User Station B** Stop the Standby telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=5**	In the X-term window containing the telemetry driver responsible for the multicast of Standby packets, the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2170B" has stopped updating and all Standby mnemonics on that the alphanumeric display page are marked as "STATIC". **Note:** The alphanumeric page "TLM2010B" should continue to update.	
41.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "Q Decom: Timeout receiving data, timeout is 5 seconds" appears (red in color) in the Control window.	
42.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button becomes inactive at both user stations.	
43.	Stop the Housekeeping telemetry driver by entering **CTRL-C** in the X-term window.	The message "end points were unregistered successfully…." appears in the X-term window. All mnemonics on alphanumeric display page "TLM2010B",at User Station A, are marked as static.	

44.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" appears (red in color) in the Control window.	
45.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	
46.	**<u>AT User Station A</u>** Move the cursor over the "TLM2010B" alphanumeric page.		
47.	Click the mouse on the right button.		
48.	Choose "Data Source Selector" from the menu.	The "Data Source Switcher" window will appear.	
49.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the Q channel on the right.	Both rows will become highlighted.	
50.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box.	
51.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	

52.	Start the telemetry driver (the one which is still active; has endpoints) to multicast Housekeeping telemetry packets on the I channel by entering the following in the ECL directive line of the Control window:
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20010 APID=1**
	
	    ECL>**PG STARTDATA APID=1 COUNT=-1**
	
	Note: This driver was previously used for the multicast of Standby telemetry packets on the Q channel)
		Verify, after one master cycle, that all mnemonic's "STATIC" flags on both alphanumeric pages have disappeared.	

53.	**<u>AT Station A</u>** Move the cursor over the "TLM2170B" alphanumeric page.		
54.	Click the mouse on the right button.		
55.	Choose "Data Source Selector" from the menu.	The "Data Source Switcher" window will appear.	
56.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for the I channel on the right.	Both rows will become highlighted.	
57.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box. Mnemonics "STATIC" flags will appear on alphanumeric page "TLM2170B".	

58.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	

59.	**AT User Station B**
	
	Invoke the EDOS telemetry driver for the multicast of Health & Safety telemetry packets for processing on the I channel.
	
	In the terminal window previously used to multicast Housekeeping telemetry packets on the I channel, enter the following:
	
	    %: **cd /fosb/test/am1/scripts/setup**
	
	    %: **setenv SCRIPT UserStation**
	
	    %: **source FosEnvVars**
	
	    %: **cd /fosb/test/am1/bin/sun_sparc_5-5**
	
	    %: **FtPgPackGen**
		The message "Packet Generator is ready to receive directives" should appear in the x-term window.	

60.	To start the second telemetry driver, enter the following in the ECL directive line of the Control window:
	
	    ECL>**PG CONFIG HOST=225.2.7.000 PORT=20002 APID=2**
	
	    ECL>**PG STARTDATA APID=2 COUNT=-1**
		At User Station A, verify, after one master cycle, that the Health and Safety mnemonic's "STATIC" flags on the alphanumeric page "TLM2170B" have disappeared.	

61.	**AT User Station A** Allow the packet generator to run for approximately 5 minutes. Verify that both alphanumeric display pages, "TLM2170B" and "TLM2010B" continue to update as Housekeeping data flows on the Q channel and Standby data flows on the I channel.	All Housekeeping and Health and Safety mnemonics are marked as active and continue to update.	
62.	**AT User Station B** Stop the Health and Safety telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=2**	In the X-term window responsible for the multicast of Health and Safety telemetry, the message "FtPgPackGen STOPDATA: Data has stopped" should appear. Verify that the alphanumeric page "TLM2170B" has stopped updating and all mnemonics on that the alphanumeric display page are marked as "STATIC". **Note:** The alphanumeric page "TLM2010B" should continue to update.	
63.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" should appear (red in color) in the Control window.	
64.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button will become inactive at both user stations.	

65.	**AT User Station B**	At User Station A, verify (after one master cycle) that the Standby telemetry mnemonic's "STATIC" flags on the alphanumeric page "TLM2170B" have disappeared.	
	Invoke the EDOS telemetry driver for the multicast of Standby telemetry packets for processing on the I channel.		
	ECL>**PG CONFIG HOST=225.2.7.000 PORT=20004 APID=5**		
	ECL>**PG STARTDATA APID=5 COUNT=-1**		
66.	**AT User Station A**	All Housekeeping and Standby mnemonics are marked as active and continue to update.	
	Allow the packet generator to run for approximately 5 minutes. Verify that both alphanumeric display pages, "TLM2170B" and "TLM2010B" continue to update as Housekeeping data flows on the Q channel and Standby data flows on the I channel.		
67.	**AT USER STATION B**	In the X-term window responsible for the multicast of Standby telemetry, the message "FtPgPackGen STOPDATA: Data has stopped" appears.	
	Stop the Standby telemetry driver by entering the following in the ECL directive line of the Control window:		
	ECL>**PG STOPDATA APID=5**	Verify that the alphanumeric page "TLM2170B" has stopped updating and all mnemonics on that the alphanumeric display page have become static.	
		Note: The alphanumeric page "TLM2010B" should continue to update.Telemetry stops flowing on Channel I.	

68.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "I Decom: Timeout receiving data, timeout is 5 seconds" appears (red in color) in the Control window.	
69.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button becomes inactive at both user stations.	
70.	Stop the Standby telemetry driver by entering the following in the ECL directive line of the Control window: ECL>**PG STOPDATA APID=1**	In the X-term window responsible for the multicast of Housekeeping telemetry, the message "FtPgPackGen STOPDATA: Data has stopped" appears. Verify that the alphanumeric page "TLM2010B" has stopped updating and all mnemonics on that the alphanumeric display page have become static.	
71.	Verify that an event message appears notifying the user that Decom has timed out.	The event message "Q Decom: Timeout receiving data, timeout is 5 seconds" appears (red in color) in the Control window.	
72.	Click the mouse on the red "ACK" button in the Control window at both user stations.	The "ACK" button becomes inactive at both user stations.	
73.	Log off both of the user stations.		
74.	End of test.		

TLM-2190 Telemetry Replay Processing and Display

Test Case No.: TLM 2190B

Test Title: Telemetry Replay Processing and Display

Test Configuration: See Appendix G

Test Support: Telemetry packet driver "packGen" supporting multiple APID's, valid sequence counts, packet length, time stamp and telemetry data values. Previously defined alphanumeric display pages "Header" and "Rplay", schematic "2190BSchem", table "TLM2190B", and graph "2190BGraph". Housekeeping, Health & Safety and Standby mnemonics defined in the I&T database with offsets matching those output by the telemetry data driver. A predefined procedure that is used by the Telemetry packet generator to input raw values for each mnemonic. Archived files for each data type.

Test Description: This test verifies the ability to replay stored real-time and spacecraft recorder telemetry via menu options provided by the Replay Controller Tool and other user interface supplied menu options. A secondary objective is to ensure processing of replayed data mimics real-time telemetry processing including decomutation, EU conversion, limit/delta limit checking, data quality checking and subsequent display of parameter values and flags.

The test begins with the initialization of the replay logical string, and the initialization of several EOC user stations in support of the replay string. The Replay Controller Tool is invoked, and pre-defined replay alphanumeric telemetry pages, telemetry plots, telemetry strip charts and telemetry schematics are displayed at various user stations. Replay information (i.e. spacecraft ID, start/stop time, data type, replay time) is entered via selected Replay Controller menu options. The replay of housekeeping telemetry is initiated and display pages, plots, graphs and schematics are displayed and printed. They are analyzed and compared post-test against telemetry archive file dumps (and against each other) to ensure accurate parameter value (raw or EU) and/or flag display (i.e. static, limits, delta limits, quality). Steps are provided to pause and resume the replay at a new begin time via the selection of Replay Controller options. The above steps are repeated for the replay of Health & Safety and diagnostic telemetry packets.

Success Criteria: Via off-line analysis, parameter values (raw or EU) and parameter status information (i.e. applicable parameter flags, UTC, spacecraft time, current orbit number, data source, current major/minor cycle counts, current telemetry format, current telemetry rate, spacecraft ID) from replay pages, plots, strip charts and/or schematics matches values in the replay data stream. The database ID matching the replay time period is automatically loaded and used for replay data processing. All replay displays provide a visual indication of the start time, stop time, and position of current time during the replay. Each user, once assigned to the replay logical string, may view the initiated replay by displaying replay pages, plots, strip charts, and/or schematics. Packet replay matches start/stop time specified, and is replayed at the replay rate. Replay pause causes replay telemetry pages to discontinue updating. Resumption of the replay results in the processing of historical packets at the point where the pause occurred.

Step Id	Action	Expected Result/Output	Pass/ Fail
1.	Log onto an EOC workstation. Start the Data Server. Reference Test Case SYS2000B -- FOS Server Startup.	Data Server processes are running.	
2.	Start the Real-Time Server. Reference Test Case SYS2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	Log onto an FOT User Station. Start the User Station. Reference Test Case SYS2010B -- User Station Startup and Authentication.	The FOT User Station is running and the "Control window" is displayed.	
4.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
5.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	

6.	Click the mouse on the "OK" button below the selection box.	The "Global Event Display" appears on the screen.	
7.	Connect to a real-time operational string, to accept Health & Safety data, by entering the following in the ECL directive line of the Control window: ECL>**STRING CONNECT STRING=100 CONFIG= MIRROR**	The following message will appear in the Event Display window: "Successfully connected to string 100".	

| 8. | At the user station, display the EDU Header alphanumeric page which displays telemetry header field values by entering the following in the ECL directive line of the Control window:

    ECL> **PAGE Header** | Verify the Header window appears at the user station and contains the following fields:

-Static flags for all descriptors

-Spacecraft time (SDU_SCTIME)

-Data source (spacecraft ID) (EDS_SCID)

-Quality indicator (EDS_QUALITY)

-APID number (SDU_PCKT_APID)

-Packet sequence count SDU_PACKET_SEQ)

-SDU Header(SDU_SEC_HEADER)

-Packet length count (SDU_PCKT_LENGTH)

-EDS cycle count (EDS_CYCLE_COUNT)

-CCSDS header length (CCSDS_HDR_LENGTH)

-CCSDS Version (SDU_CCSDS_VER)

"STATIC" flags should be present for all descriptors. | |

| 9. | At the user station, display the "TLM2190B" alphanumeric page which displays telemetry header field values by entering the following in the ECL directive line of the Control window:

ECL> **PAGE TLM2190B** | Verify the "TLM2190B" alphanumeric display appears at the user station and contains the following:

Housekeeping Data:

-GNC_SR_FIN_PTCHERR1

-GNC_BR_ANG_MODE_2

-MIS_IR_CAMERA_AA28V

-CDH_BR_SSR1_SCRPLY

Health & Safety Mnemonics:

-COM_IR_SBT2_XMTR

-CDH_NR_SSR2_HKRECTR

-MOD_CR_CPB_EEP_WRE_S

-COM_BR_HSDLTA

Standby Mnemonics:

-CDH_NR_ACT_B_FRONT

-CDH_CR_ACT_RPT_TYP

-CDH_BR_SCC2_VALDAT

-CDH_CR_SBDLTA

 "STATIC" flags should be present for all descriptors. | |
| 10. | **REPLAY REQUEST SUBMISSION** | **FOR INFORMATION ONLY** | |

11.	At the user station click the mouse on "Tools" button.	The Tool Selection Dialog Box will appear on the screen.	
12.	Select "Replay_Control" from the Control window tools menu.	The "Replay_Control" becomes highlighted and appears in the Selection Box.	
13.	Click the mouse on "OK".	The Replay Control window will appear on the screen.	
14.	**Dedicated Replay (Housekeeping)**	**For Information Only**	
15.	At user station submit a request to replay Housekeeping telemetry by selecting the following in the top half of the Replay Controller window: **Replay String Specification** Spacecraft = AM1 Data Base = 1.0 Data Type = Housekeeping Replay Type = Dedicated Replay Rate = 16 **Archive Telemetry Specification** Start Time = 1997/234 00:00:01 Stop Time = 1997/234 00:10:00	Verify that all information displayed in the top half of the Replay Controller window appears correctly.	

16.	Click the mouse on "Submit Request".	The top half of the Replay Controller window should become gray and "Inactive" and the bottom half of the Replay controller should become "Active".	
		Verify that the following event messages appear in the Event Display window:	
		"Decom Process successfully configured."	
		"Replay Decom: Ready to receive telemetry packets."	
		"String 1 was Created."	
17.	View the times above the bar in the Replay Controller window.	Verify that the time on the left matches the submitted "Start Time" and the time on the right matches the submitted "Stop Time".	
18.	Move the cursor over the "Header" alphanumeric page.		
19.	Click the right mouse button.		
20.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
21.	Click the mouse on the "Refresh" button.	The Replay string with String ID 1 will appear in the "Established Connection" box.	
22.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for "String ID 1" (the replay string) on the right.	Both rows will become highlighted.	

23.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box. The assigned connection will now be the replay string which is "String ID 1"	
24.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
25.	Move the cursor over the "TLM2190B" alphanumeric page and repeat steps 19 - 24.	The "Data Source Selector" window will disappear.	
26.	Click the mouse on the "Play" button.	Monitor (after one master cycle) that the Housekeeping mnemonics "STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active.	
27.	View the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:01:58 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
28.	View the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:02:36 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

29.	View the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:04:10 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
30.	Click the mouse on the "Pause" button.	Verify that telemetry flow has paused. All mnemonics on display pages "Header" and "TLM2190B" are marked with "STATIC" flags.	
31.	Increase the replay rate by entering "192" in the Replay Rate (Kbps) window.	Verify, in the Status window, that Replay Rate=192.	
32.	Click the mouse on the "Reset" button.	Verify that the marker slides back on the Bar and that the current time now matches the beginning time.	
33.	Click the mouse on the "Play" button.	Verify that telemetry begins flowing. All mnemonics on display pages "Header" and "TLM2190B" are marked as "active".	
34.	View the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:01:58 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	

35.	View the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:02:36 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
36.	View the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:04:10 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snap is printed at the system printer. Collect the printout for off-line analysis.	
37.	Click the mouse on the "Pause" button.	Verify that telemetry flow has paused. All mnemonics on display pages "Header" and "TLM2190B" are marked with "STATIC" flags.	
38.	Click the mouse on the "Kill" button.	The FuRcQuestionDialog box will appear asking: "Do you really want to kill the operation?"	

39.	Click the mouse on the "OK" button.	Verify that the following event messages appear in the Event Display window:	
		"Replay Decom: Exiting normally."	
		"Successfully terminated telemetry process ID: xxxx." "String 1 was deleted."	
		"FdQueueMgr Replay # x terminated.	
		The upper half of the Replay Controller window in user station will become "active".	
40.	Via offline analysis, verify that the mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCDS_VER, and SDU_PCKT_SEQ, as shown on screen snaps of the user station, match values specified in Table TLM2190B-1.	The mnemonics, as shown on the screen snaps of the user station, will match the values specified in table TLM2190B-1.	
41.	**SHARED REPLAY**	**FOR INFORMATION ONLY**	
42.	Log onto another User Station which will be referred to as Station B.		
43.	Click the mouse on the "Tools" button in the Control window.	The "Tools Selection" box appears on the screen.	
44.	Select "Event_Display_Global" from the Control window tools menu.	The "Event_Display_Global" becomes highlighted and appears in the Selection Box.	
45.	Click the mouse on the "OK" button below the selection box.	The "Global Event Display" appears on the screen.	

| 46. | At User Station B, display the EDU Header alphanumeric page which displays telemetry header field values by entering the following in the ECL directive line of the Control window:

ECL> **PAGE Header** | Verify the Header window appears at the user station and contains the following fields:

-Static flags for all descriptors

-Spacecraft time (SDU_SCTIME)

-Data source (spacecraft ID) (EDS_SCID)

-Quality indicator (EDS_QUALITY)

-APID number (SDU_PCKT_APID)

-Packet sequence count SDU_PACKET_SEQ)

-SDU Header(SDU_SEC_HEADER)

-Packet length count (SDU_PCKT_LENGTH)

-EDS cycle count (EDS_CYCLE_COUNT)

-CCSDS header length (CCSDS_HDR_LENGTH)

-CCSDS Version (SDU_CCSDS_VER)

"STATIC" flags should be present for all descriptors. | |

| 47. | At User Station B, display the "TLM2190B" alphanumeric page which displays telemetry header field values by entering the following in the ECL directive line of the Control window:

ECL> **PAGE TLM2190B** | Verify the "TLM2190B" alphanumeric display appears at the user station and contains the following:

Housekeeping Data:

-GNC_SR_FIN_PTCHERR1

-GNC_BR_ANG_MODE_2

-MIS_IR_CAMERA_AA28V

-CDH_BR_SSR1_SCRPLY

Health & Safety Mnemonics:

-COM_IR_SBT2_XMTR

-CDH_NR_SSR2_HKRECTR

-MOD_CR_CPB_EEP_WRE_S

-COM_BR_HSDLTA

Standby Mnemonics:

-CDH_NR_ACT_B_FRONT

-CDH_CR_ACT_RPT_TYP

-CDH_BR_SCC2_VALDAT

-CDH_CR_SBDLTA2

"STATIC" flags should be present for all descriptors. | |

48.	**SHARED REPLAY SUBMISSION** (Healt & Safety Telemetry)	Verify that all information displayed in the top half of the Replay Controller window appears correctly.	
	At user station A submit a request to replay Housekeeping telemetry by selecting the following in the top half of the Replay Controller window:		
	Replay String Specification		
	Spacecraft = AM1		
	Data Base = 1.0		
	Data Type = Health		
	Replay Type = Shared		
	Replay Rate = 10		
	Archive Telemetry Specification		
	Start Time = 1997/234 00:00:01		
	Stop Time = 1997/234 00:59:00		

49.	Click the mouse on "Submit Request".	The top half of the Replay Controller window should become gray and "Inactive" and the bottom half of the Replay controller should become "Active". Verify that the following event messages appear in the Event Display window: "Decom Process successfully configured." "Replay Decom: Ready to receive telemetry packets." "String 1 was Created."	
50.	View the times above the bar in the Replay Controller window.	Verify that the time on the left matches the requested Start Time and the time on the right matches the requested Stop Time	
51.	Move the cursor over the "Header" alphanumeric page.		
52.	Click the right mouse button.		
53.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
54.	Click the mouse on the "Refresh" button.	The Replay string with String ID 1 will appear in the "Established Connection" box.	
55.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for "String ID 1" (the replay string) on the right.	Both rows will become highlighted.	

56.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box. The assigned connection will now be the replay string which is "String ID 1"
57.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.
58.	Move the cursor over the "TLM2190B" alphanumeric page and repeat steps 19 - 24.	The "Data Source Selector" window will disappear.
59.	Click the mouse on the Play button.	Monitor (after one master cycle) that mnemonic's STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active at both User Stations.
60.	At User Station A,view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:15:09 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %:**snap** At User Station B, view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:15:09 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis. **NOTE**: A notification is received for every change in limit condition for each telemetry mnemonic. The notification will contain the following: -Current packet time stamp -Telemetry mnemonic -Parameter value -Limit condition -Assigned limit values

| 61. | At User Station A,view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:16:14 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:

    %:**snap**

At User Station B, view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:16:14 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:

    %: **snap** | The snap is printed at the system printer. Collect the printout for off-line analysis. | |

62.	At User Station A,view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:17:22 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:
	
	    %:**snap**
	
	At User Station B, view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:17:22 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:
	
	    %: **snap**
		The snap is printed at the system printer. Collect the printout for off-line analysis.	

63.	Click the mouse on the "Pause" button in the Replay Controller window.	Verify that all telemetry stopped flowing on user stations A and B.	
64.	At user station A, click the mouse on the "Reset" button.	Verify that the marker slides back on the Bar and that the current time now matches the beginning time.	
65.	Click the mouse on the "Play" button.	Verify, at both user stations that telemetry begins to flow.	
66.	Click the mouse on the "Pause" button.	Verify that telemetry flow has paused. All mnemonics on display pages "Header" and "TLM2190B" are marked with "STATIC" flags.	

67.	Click the mouse on the "Kill" button.	The FuRcQuestionDialog box will appear asking:	
		"Do you really want to kill the operation?"	
68.	Click the mouse on the "Yes" button.	Verify that the following event messages appear in the Event Display window:	
		"Replay Decom: Exiting normally."	
		"Successfully terminated telemetry process ID: *xxxx*." "String 1 was deleted."	
		"FdQueueMgr Replay # *x* terminated.	
		The upper half of the Replay Controller window in user station will become "active".	
69.	Via offline analysis, verify that the mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCDS_VER, and SDU_PCKT_SEQ, as shown on screen snaps of the user station, match values specified in Table TLM2190B-2.	The mnemonics, as shown on the screen snaps of "Header" alphanumeric page will match the values specified in table TLM2190B-2.	
70.	Verify that the Health & Safety mnemonics, as shown on screen snaps for the user stations **fose8oe**: Table "TLM2190B" Alphanumeric page "Rplay" **fose10oe:** Schematic "2190BSchem" Graph "2190BGraph" match values specified in Table TLM2190B-2.	The Health & Safety telemetry mnemonics as shown on screen snaps of fose8oe and fose10oe will match values specified in Table TLM2190B-2.	

71.	**SHARED REPLAY SUBMISSION**	Verify that all information displayed in the top half of the Replay Controller window appears correctly.	
	(Standby Telemetry)		
	At user station A submit a request to replay Housekeeping telemetry by selecting the following in the top half of the Replay Controller window:		
	Replay String Specification		
	Spacecraft = AM1		
	Data Base = 1.0		
	Data Type = Standby		
	Replay Type = Shared		
	Replay Rate = 150		
	Archive Telemetry Specification		
	Start Time = 1997/234 00:00:01		
	Stop Time = 1997/234 00:59:00		

72.	Click the mouse on "Submit Request".	The top half of the Replay Controller window should become gray and "Inactive" and the bottom half of the Replay controller should become "Active". Verify that the following event messages appear in the Event Display window: "Decom Process successfully configured." "Replay Decom: Ready to receive telemetry packets." "String 1 was Created."	
73.	View the times above the bar in the Replay Controller window.	Verify that the time on the left matches the requested Start Time and the time on the right matches the requested Stop Time	
74.	Move the cursor over the "Header" alphanumeric page.		
75.	Click the right mouse button.		
76.	Choose Data Source Selector from the menu.	The Data Source Selector window will appear.	
77.	Click the mouse on the "Refresh" button.	The Replay string with String ID 1 will appear in the "Established Connection" box.	
78.	Highlight the "Assigned Connection" windows on the left and then highlight the "Established Connection" for "String ID 1" (the replay string) on the right.	Both rows will become highlighted.	

79.	Click the mouse on the "Switch Connection" button.	The message "Data Sources Switched Successfully" will appear in the status box. The assigned connection will now be the replay string which is "String ID 1"	
80.	Click the mouse on the "Close" button.	The "Data Source Selector" window will disappear.	
81.	Move the cursor over the "TLM2190B" alphanumeric page and repeat steps 19 - 24.	The "Data Source Selector" window will disappear.	
82.	Click the mouse on the Play button.	Monitor (after one master cycle) that mnemonic's STATIC" flag indicators no longer appear on any of the display pages and that the mnemonics are marked as active at both User Stations.	
83.	At User Station A,view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:15:09 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %:**snap** At User Station B, view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:15:09 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window: %: **snap**	The snaps are printed at the system printer. Collect the printouts for off-line analysis. **NOTE**: A notification is received for every change in limit condition for each telemetry mnemonic. The notification will contain the following: -Current packet time stamp -Telemetry mnemonic -Parameter value -Limit condition -Assigned limit values	

| 84. | At User Station A,view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:16:14 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:

    %:**snap**

At User Station B, view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:16:14 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:

    %: **snap** | The snap is printed at the system printer. Collect the printout for off-line analysis. | |

85.	At User Station A,view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:17:22 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:
	
	      %:**snap**
	
	At User Station B, view the "Header" page and when the spacecraft time (SDU_SCTIME) is 1997/234 00:17:22 at the user station, snap the alphanumeric pages "Header" and "TLM2190B" by entering the following inside a terminal window:
	
	      %: **snap**
		The snap is printed at the system printer. Collect the printout for off-line analysis.	

86.	Click the mouse on the "Pause" button in the Replay Controller window.	Verify that all telemetry stopped flowing on user stations A and B.	
87.	At user station A, click the mouse on the "Reset" button.	Verify that the marker slides back on the Bar and that the current time now matches the beginning time.	
88.	Click the mouse on the "Play" button.	Verify, at both user stations that telemetry begins to flow.	
89.	Click the mouse on the "Pause" button.	Verify that telemetry flow has paused. All mnemonics on display pages "Header" and "TLM2190B" are marked with "STATIC" flags.	

90.	Click the mouse on the "Kill" button.	The FuRcQuestionDialog box will appear asking: "Do you really want to kill the operation?"	
91.	Click the mouse on the "Yes" button.	Verify that the following event messages appear in the Event Display window: "Replay Decom: Exiting normally." "Successfully terminated telemetry process ID: *xxxx*." "String 1 was deleted." "FdQueueMgr Replay # *x* terminated. The upper half of the Replay Controller window in user station will become "active".	
92.	Via offline analysis, verify that the mnemonics SDU_SCTIME, EDS_SCID, EDS_QUALITY, SDU_PCKT_APID, SDU_PCKT_LENGTH, SDU_CCDS_VER, and SDU_PCKT_SEQ, as shown on screen snaps of the user station, match values specified in Table TLM2190B-3.	The mnemonics, as shown on the screen snaps of "Header" alphanumeric page will match the values specified in table TLM2190B-3.	
93.	Verify that the Standby mnemonics, as shown on screen snaps for the user stations **fose8oe**: Table "TLM2190B" Alphanumeric page "Rplay" **fose10oe:** Schematic "2190BSchem" Graph "2190BGraph" match values specified in Table TLM2190B-2.	The Standby telemetry mnemonics as shown on screen snaps of User Station A and User Station B will match values specified in Table TLM2190B-2. **Note**: *TBS(4), TBS(5) and TBS(6) are non-housekeeping mnemonics and will still be marked as "NODATA" and "STATIC".*	

94.	Click the mouse on "File" at the top of the Replay Controller window.	A pull-down menu will appear.	
95.	Select "Quit" from the menu.	The Replay Controller window will close.	
96.	Log off the user stations fose80e and fose10oe.		
97.	End of test.		

Table 5-12. TLM 2190B-1

SDU_SCTIME	1997/234 00:01:58	1997/234 00:02:36	1997/234 00:04:10
EDS_SCID	42	42	42
EDS_QUALITY	0	0	0
SDU_PCKT_APID	1	1	1
SDU_PCKT_LENGTH	1658	1658	1658
SDU_CCDS_VER	0	0	0
SDU_PCKT_SEQ	15	30	45
GNC_SR_FIN_PTCHERR1	-3.191	-4.385	-4.982
GNC_BR_ANG-MODE_2	NORMAL_ANGLE	WIDE_ANGLE	NORMAL_ANGLE
MIS_IR_CAMERA_AA28V	0.717	0.358	0.036
CDH_BR_SSR1_SCRPLY	OFF	SCI_REPLAY	OFF

Table 5-13. TLM 2190B-2 (1 of 2)

SDU_SCTIME	TBS	TBS	TBS
EDS_SCID	42	42	42
EDS_QUALITY	0	0	0
SDU_PCKT_APID	1	1	1
SDU_PCKT_LENGTH	1658	1658	1658
SDU_CCDS_VER	0	0	0
SDU_PCKT_SEQ	15	30	45

Table 5-13. TLM 2190B-2 (2 of 2)

SDU_SCTIME	TBS	TBS	TBS
COM_IR_SBT2_XMTR	TBS	TBS	TBS
CDH_NR_SSR2_HKRECTR	TBS	TBS	TBS
MOD_CR_CPB_EEP_WRE_S	TBS	TBS	TBS
COM_BR_HSDLTA	TBS	TBS	TBS

Table 5-14. TLM 2190B-2

SDU_SCTIME	TBS	TBS	TBS
EDS_SCID	42	42	42
EDS_QUALITY	0	0	0
SDU_PCKT_APID	1	1	1
SDU_PCKT_LENGTH	1658	1658	1658
SDU_CCDS_VER	0	0	0
SDU_PCKT_SEQ	15	30	45
CDH_NR_ACT_B_FRCNT	TBS	TBS	TBS
CDH_CR_ACT_RPT_TYP	TBS	TBS	TBS
CDH_BR_SCC2_VALDAT	TBS	TBS	TBS
CDH_CR_SBDLTA2	TBS	TBS	TBS

Dataset Generation - General Analysis Test Procedure

Test Case No: ANA-2000B

Test Configuration: See Appendix G

Test Support: Previously saved telemetry archive files in the archive area that contain mnemonics and times to match user specified analysis requests. Previously saved Analysis Request to function as a template.

Test Dependencies: Previously archived telemetry: real-time housekeeping file that contains housekeeping, health and safety, and standby data.

Test Case Description:

This test is designed to verify the ability to build a telemetry history request via the combination of user interface and analysis tool options and automatically generate a dataset of matching archived telemetry data based on selected analysis options (i.e. telemetry parameter names, start/stop time intervals, sampling rates, etc.). The test begins with the initialization of the EOC. The Analysis Request tool is invoked and a historical request is generated, with selected options including request name, start/stop time interval, parameter names, and sampling rates. The requests are saved, and then submitted for dataset generation based on the menu options previously submitted. ASCII printouts are generated and analyzed post-test to ensure dataset accuracy and integrity. The next portion of the test deals with the selection of menu options causing error conditions (i.e. attempting to enter invalid sampling rates, modifying a previously saved request, etc.). Following the completion of each valid request, the request is submitted for dataset generation.

Success Criteria:

This test is considered successful when all of the user interface menus supporting telemetry history include the proper fields (parameter name, data type, start/stop time intervals, and data quality information); It is determined, via post-test analysis, that the telemetry history reports generated match the users request and that the data is not compromised in any way through the retrieval and generation process; All illegal entries, with the exception of mnemonics, will result in an error message and disallow dataset generation; Illegal mnemonics will be left out of the dataset generation.

Step Id	Action	Expected Result/Output	Pass/ Fail

1.	**<u>Start the Data Server.</u>** Reference Test Case SYS-2000B -- FOS Server Startup.	Data Server processes are running.	
2.	**<u>Start the Real-Time Server.</u>** Reference Test Case SYS-2000B -- FOS Server Startup.	Real-Time Server processes are running.	
3.	**<u>Start the User Station.</u>** Reference Test Case SYS-2010B -- User Station Startup and Authentication.	The FOT User Station is running and the 'Control window' is displayed.	
4.	**<u>Invoke the Event Display</u>**. Click on the 'Tools' button.	The Tools Dialog window and a list of tools is displayed to the user.	
5.	Select 'Event_Display_Gobal' from the Control window tools menu. Click on 'OK' button.	The 'Event Display' is displayed on the FOT User Station.	
6.	Click on 'Filter' from the pull down menu Select 'Event Type' Click 'Bold' button next to ANL & SYS Click 'Apply' Click 'Close'	The Event_Display_Gobal will now display all ANA subsystem activities in bold.	
7.	**<u>Invoke the Analysis Request Builder</u>** Click on the 'Tools' button.	The Tools Dialog window and a list of tools is displayed to the user.	

8.	Select 'Analysis_Request_Builder'. Click on 'OK' button.	The Analysis Request Builder window is displayed and it contains the following fields and user interface menus: Request Name Processing site of data (local or EOC) Data quality Select Telemetry Select Time Product Options Product Formats Algorithms	
9.	**<u>Create an Analysis Request</u>** Enter into the request name field: **Myrequest1**	Myrequest1 appears in the Request Name field.	
10.	Click the mouse on the 'EOC Only' icon to select data to be processed in the EOC.	'EOC Only' icon should show selected.	
11.	Click the mouse on the 'All Data' button in the Data Quality box.	The 'All Data' button should show selected.	

12.	**Selecting Telemetry Mnemonics** Click on the 'Select Telemetry …' button.	The Telemetry Selector window is displayed and it contains the following fields and user interface menus: Subsystems Available Parameters Sampling rates Statistics interval time Selected Parameters Data Filters The possible choices in the sampling rate field include: All data Changes only Every Nth sample where N equals a user specified number.	
13.	**Note:** Fields are displayed as the user selects a filter criteria. Invoke the Selection Filter Screen: Click on the 'Filter…' button.	The Selection Filter Screen is displayed and it contains the following fields and user interface menus: Spacecraft text area Instrument text area Sample Type text area Selected subsystem text area	

14.	Select '**AM1**' in the Spacecraft text area.	Instruments associated with AM1 are displayed in the Instrument text area.	
15.	Select '**CDH**' in the Instrument text area.	Sample Types associated with CDH are displayed in the Sample Type text area.	
16.	Select '**B**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CDH_B is displayed in the Selected text area.	
17.	Select '**C**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CDH_C is displayed in the Selected text area.	
18.	Select '**I**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CDH_I is displayed in the Selected text area.	
19.	Select '**N**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CDH_N is displayed in the Selected text area.	
20.	Select '**S**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CDH_S is displayed in the Selected text area.	
21.	Select '**CEA**' in the Instrument text area.	Sample Types associated with CEA are displayed in the Sample Type text area.	
22.	Select '**C**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CEA_C is displayed in the Selected text area.	
23.	Select '**V**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CEA_V is displayed in the Selected text area.	

24.	Select '**CEF**' in the Instrument text area.	Sample Types associated with CEF are displayed in the Sample Type text area.	
25.	Select '**N**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CEF_N is displayed in the Selected text area.	
26.	Select '**COM**' in the Instrument text area.	Sample Types associated with COM are displayed in the Sample Type text area.	
27.	Select '**B**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_COM_B is displayed in the Selected text area.	
28.	Select '**I**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_COM_I is displayed in the Selected text area.	
29.	Select '**P**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_COM_P is displayed in the Selected text area.	
30.	Select '**EAS**' in the Instrument text area.	Sample Types associated with EAS are displayed in the Sample Type text area.	
31.	Select '**B**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_EAS_B is displayed in the Selected text area.	
32.	Select '**EPS**' in the Instrument text area.	Sample Types associated with EPS are displayed in the Sample Type text area.	
33.	Select '**S**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_EPS_S is displayed in the Selected text area.	

34.	Select '**FS1**' in the Instrument text area.	Sample Types associated with FS1 are displayed in the Sample Type text area.	
35.	Select '**N**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_FS1_N is displayed in the Selected text area.	
36.	Select '**GNC**' in the Instrument text area.	Sample Types associated with GNC are displayed in the Sample Type text area.	
37.	Select '**B**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_GNC_B is displayed in the Selected text area.	
38.	Select '**S**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_GNC_S is displayed in the Selected text area.	
39.	Select '**PMS**' in the Instrument text area.	Sample Types associated with PMS are displayed in the Sample Type text area.	
40.	Select '**T**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_PMS_T is displayed in the Selected text area.	
41.	Select '**SDU**' in the Instrument text area.	Sample Types associated with SDU are displayed in the Sample Type text area.	
42.	Click on the 'Select' button.	The subsystem mnemonic AM1_SDU is displayed in the Selected text area.	
43.	Select '**SMS**' in the Instrument text area.	Sample Types associated with SMS are displayed in the Sample Type text area.	
44.	Select '**S**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_SMS_S is displayed in the Selected text area.	

45.	Select '**TCS**' in the Instrument text area.	Sample Types associated with TCS are displayed in the Sample Type text area.	
46.	Select '**I**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_TCS_I is displayed in the Selected text area.	
47.	Click the 'OK' button.	The filter list is displayed in the Analysis Telemetry Selector window in the Subsystems section.	
48.	**Health & Safety telemetry points and sampling rate** Click on the '**AM1_CDH_I**' toggle button in the subsystems text area.	A list of mnemonics associated AM1_CDH_I with are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
49.	Select '**CDH_IR_PRP_BDU_EPCA**' in the available parameters text area. Select a sampling rate. Click the 'All Data' button. Click the 'Select' button.	CDH_IR_PRP_BDU_EPCA along with the selected sample rate are displayed in the Selected Parameters field.	
50.	Click the '**AM1_CDH_I**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
51.	Click the '**AM1_COM_P**' toggle button.	A list of mnemonics associated AM1_COM_P with are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	

52.	Select **'COM_PR_SBT2_FWD_RF'** in the available parameters text area. Select a sampling rate. Click the 'All Data' button. Click the 'Select' button.	COM_PR_SBT2_FWD_RF along with the selected sample rate are displayed in the Selected Parameters field.	
53.	Click on the '**AM1_COM_P**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
54.	Click on the '**AM1_EAS_B**' toggle button.	A list of mnemonics associated with AM1_EAS_B are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
55.	Select: **'EAS_BR_HGA_BOX1A_ARM'** **'EAS_BR_NEA_BUSA'** **'EAS_BR_SA_BOXE1A_ARM'** **'EAS_BR_SA_BOXI2A_ARM'** **'EAS_BR_SA_CAN2A_ARM'** in the available parameters text area. Select a sampling rate. Click the 'All Data' button. Click the 'Select' button.	Mnemonics: EAS_BR_HGA_BOX1A_ARM EAS_BR_NEA_BUSA EAS_BR_SA_BOXE1A_ARM EAS_BR_SA_BOXI2A_ARM EAS_BR_SA_CAN2A_ARM along with the selected sample rate are displayed in the Selected Parameters field.	
56.	Click on the '**AM1_EAS_B**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	

57.	Click on the '**AM1_EPS_S**' toggle button.	A list of mnemonics associated with AM1_EPS_S are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
58.	Select: '**EPS_SR_ADEADRIVERATE**' '**EPS_SR_BBAT_CHRGRTA**' '**EPS_SR_PBAT_VTCRVA**' '**EPS_SR_SA_RAT_ADJ_A**' in the available parameters text area. Select a sampling rate. Click the 'All Data' button. Click the 'Select' button.	Mnemonics: EPS_SR_ADEADRIVERATE EPS_SR_BBAT_CHRGRTA EPS_SR_PBAT_VTCRVA EPS_SR_SA_RAT_ADJ_A along with the selected sample rate are displayed in the Selected Parameters field.	
59.	Click on the '**AM1_EPS_S**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
60.	Click on the '**AM1_GNC_B**' toggle button.	A list of mnemonics associated with AM1_GNC_B are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
61.	Select '**GNC_BR_ESA1_TRL_EDG**' in the available parameters text area. Select a sampling rate. Click the 'All Data' button. Click the 'Select' button.	GNC_BR_ESA1_TRL_EDG along with the selected sample rate are displayed in the Selected Parameters field.	

62.	Click on the '**AM1_GNC_B**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
63.	Click on the '**AM1_PMS_T**' toggle button.	A list of mnemonics associated with AM1_PMS_T are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
64.	Select: '**PMS_TRCAT_BED_S03**' '**PMS_TR_EPC_1**' '**PMS_TR_PMEA1**' '**PMS_TR_PROP_LINE_13**' '**PMS_TR_PROP_TANK_S3**' in the available parameters text area. Select a sampling rate. Click the 'All Data' button. Click the 'Select' button.	Mnemonics: PMS_TRCAT_BED_S03 PMS_TR_EPC_1 PMS_TR_PMEA1 PMS_TR_PROP_LINE_13 PMS_TR_PROP_TANK_S3 along with the selected sample rate are displayed in the Selected Parameters field.	
65.	Click on the '**AM1_PMS_T**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
66.	Click on the '**AM1_SMS_S**' toggle button.	A list of mnemonics associated with AM1_SMS_S are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	

67.	Select:	Mnemonics:	
	'SMS_SR_HGA_DS_POTA'	SMS_SR_HGA_DS_POTA	
	'SMS_SR_HGA_DS_POTB'	SMS_SR_HGA_DS_POTB	
	in the available parameters text area.	along with the selected sample rate are displayed in the Selected Parameters field.	
	Select a sampling rate.		
	Click the 'All Data' button.		
	Click the 'Select' button.		
68.	Click on the '**AM1_SMS_S**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
69.	**Standby telemetry points with a statistics interval.** Select **'AM1_CDH_B'** toggle button in the Subsystem text area.	A list of mnemonics associated AM1_CDH_B with are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	

70.	Select:	Mnemonics:	
	'CDH_BR_ACT_DPPLRRCVD'	CDH_BR_ACT_DPPLRRCVD	
	'CDH_BR_ACT_LV_UMB_IF'	CDH_BR_ACT_LV_UMB_IF	
	'CDH_BR_CDHBU_VALDAT'	CDH_BR_CDHBU_VALDAT	
	'CDH_BR_SCT_MSGFULL'	CDH_BR_SCT_MSGFULL	
	in the available parameters text area.	along with the selected sample rate are displayed in the Selected Parameters field.	
	Select a sampling rate.		
	Click the 'Changes Only' button.		
	Click the 'Select' button.		
71.	Click on the '**AM1_CDH_B**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
72.	Select **'AM1_CDH_C'** toggle button in the Subsystem text area.	A list of mnemonics associated AM1_CDH_C with are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
73.	Select **'CDH_CR_ACT_INPUT_B1'** in the available parameters text area.	CDH_CR_ACT_INPUT_B1 along with the selected sample rate are displayed in the Selected Parameters field.	
	Select a sampling rate.		
	Click the 'Changes Only' button.		
	Click the 'Select' button.		
74.	Click on the '**AM1_CDH_C**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	

75.	Click on the '**AM1_CDH_N**' toggle button.	A list of mnemonics associated with AM1_CDH_N are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
76.	Select: '**CDH_NR_ACT_B_FRCNT**' '**CDH_NR_ACT _NXT_FRSEQ**' '**CDH_NR_SCT_CTCMDREJ**' in the available parameters text area. Select a sampling rate. Click the 'Changes Only' button. Click the 'Select' button.	Mnemonics: CDH_NR_ACT_B_FRCNT CDH_NR_ACT _NXT_FRSEQ CDH_NR_SCT_CTCMDREJ along with the selected sample rate are displayed in the Selected Parameters field.	
77.	Click on the '**AM1_CDH_N**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
78.	Click on the '**AM1_CDH_S**' toggle button.	A list of mnemonics associated with AM1_CDH_S are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
79.	Select '**CDH_SR_QLTY4**' in the available parameters text area. Select a sampling rate. Click the 'Changes Only' button. Click the 'Select' button.	CDH_SR_QLTY4 along with the selected sample rate are displayed in the Selected Parameters field.	

80.	Select **'AM1_CDH_S'** toggle button in the Subsystem text area.	AM1_CDH_S is deselected in the Subsystem text field and the list of available mnemonics is removed from the Available Parameters text field.	
81.	**Housekeeping telemetry points with a statistics interval.** Select **'AM1_CDH_C'** toggle button in the Subsystem text area.	A list of mnemonics associated with AM1_CDH_C are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
82.	Select **'CDH_CR_SSR1_CMDBUS'** in the available parameters text area. Select a sample rate. Enter into the 'Nth sample' field: **1** Click the 'Select' button.	CDH_CR_SSR1_CMDBUS along with the selected sample rate are displayed in the Selected Parameters field.	
83.	Select **'CDH_CR_CERA_SBRY_1'** in the available parameters text area. Select a sample rate. Enter into the 'Nth sample' field: **1** Click the 'Select' button.	An error dialog box will be displayed with the following message: Parameter CDH_CR_SSR1CMDBUS has already been selected. Remove this parameter from the "Selected Parameters" list box or re-select another parameter.	
84.	Click the 'Close' button in the dialog box.	The dialog box will close and the selected parameter will be displayed in the Selected Parameters field.	

85.	Click on the '**AM1_CDH_C**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
86.	Select '**AM1_CEA_C**' toggle button in the Subsystem text area.	A list of mnemonics associated with AM1_CEA_C are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
87.	Select: '**CEA_CS_INSTR_ID**' '**CEA_CS_LWSTPTT**' '**CEA_CS_SWSTPTT**' '**CEA_CS_TSTPTT**' in the available parameters text area. Select a sample rate. Enter into the 'Nth sample' field: **1** Click the 'Select' button.	Mnemonics: CEA_CS_INSTR_ID CEA_CS_LWSTPTT CEA_CS_SWSTPTT CEA_CS_TSTPTT along with the selected sample rate are displayed in the Selected Parameters field.	
88.	Click on the '**AM1_CEA_C**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
89.	Select '**AM1_CEA_V**' toggle button in the Subsystem text area.	A list of mnemonics associated with AM1_CEA_V are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	

90.	Select:	Mnemonics:	
	'CEA_VR_NVBMON'	CEA_VR_NVBMON	
	'CEA_VR_P15VMON'	CEA_VR_P15VMON	
	'CEA_VR_P5MON'	CEA_VR_P5MON	
	'CEA_VR_SPSS2'	CEA_VR_SPSS2	
	'CEA_VR_SPST1'	CEA_VR_SPST1	
	in the available parameters text area.	along with the selected sample rate are displayed in the Selected Parameters field.	
	Select a sample rate.		
	Enter into the 'Nth sample' field:		
	5		
	Click the 'Select' button.		
91.	Click on the '**AM1_CEA_V**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
92.	Select **'AM1_CEF_N'** toggle button in the Subsystem text area.	A list of mnemonics associated with AM1_CEF_N are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	

93.	Select:	Mnemonics:	
	'CEF_NR_BRPOS'	CEF_NR_BRPOS	
	'CEF_NR_LWF_2'	CEF_NR_LWF_2	
	'CEF_NR_SWCSMON'	CEF_NR_SWCSMON	
	in the available parameters text area.	along with the selected sample rate are displayed in the Selected Parameters field.	
	Select a sample rate.		
	Enter into the 'Nth sample' field:		
	5		
	Click the 'Select' button.		
94.	Click on the '**AM1_CEF_N**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
95.	Click on the '**AM1_COM_B**' toggle button.	A list of mnemonics associated with AM1_COM_B are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
96.	Select **'COM_BR_SBT2_PN_LOCK'** in the available parameters text area.	COM_BR_SBT2_PN_LOCK along with the selected sample rate are displayed in the Selected Parameters field.	
	Select a sample rate.		
	Enter into the 'Nth sample' field:		
	5		
	Click the 'Select' button.		

97.	Click on the '**AM1_COM_B**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
98.	Select **'AM1_FS1_N'** toggle button in the Subsystem text area.	A list of mnemonics associated with AM1_FS1_N are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
99.	Select: **'FS1_NR_ACQ_MODE11'** **'FS1_NR_ACQ_MODE23'** **'FS1_NR_ESAOUT_H2F'** **'FS1_NR_IRU_CNG1_R2'** **'FS1_NR_IRU_CNG2_Y2'** in the available parameters text area. Select a sample rate. Enter into the 'Nth sample' field: **10** Click the 'Select' button.	Mnemonics: FS1_NR_ACQ_MODE11 FS1_NR_ACQ_MODE23 FS1_NR_ESAOUT_H2F FS1_NR_IRU_CNG1_R2 FS1_NR_IRU_CNG2_Y2 along with the selected sample rate are displayed in the Selected Parameters field.	
100.	Click on the '**AM1_FS1_N**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
101.	Click on the '**AM1_GNC_S**' toggle button.	A list of mnemonics associated with AM1_GNC_S are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	

102.	Select **'GNC_SR_FIN_PTCHERR1'** in the available parameters text area. Select a sample rate. Enter into the 'Nth sample' field: **10** Click the 'Select' button.	GNC_SR_FIN_PTCHERR1 along with the selected sample rate are displayed in the Selected Parameters field.	
103.	Click on the '**AM1_GNC_S**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	
104.	Click on the '**AM1_TCS_I**' toggle button.	A list of mnemonics associated with AM1_TCS_I are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
105.	Select: **'TCS_IR_BATHCE_EPCA'** **'TCS_IR_BATHCE_EPCB'** in the available parameters text area. Select a sample rate. Enter into the 'Nth sample' field: **10** Click the 'Select' button.	Mnemonics: TCS_IR_BATHCE_EPCA TCS_IR_BATHCE_EPCB along with the selected sample rate are displayed in the Selected Parameters field.	
106.	Click on the '**AM1_TCS_I**' toggle button.	The list of mnemonics in the Available Parameters text area are removed.	

107.	Click on the '**AM1_SDU**' toggle button.	A list of mnemonics associated with AM1_SDU are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
108.	Select **'SDU_SCTIME'** in the available parameters text area. Select a sample rate. Enter into the 'Nth sample' field: **1** Click the 'Select' button.	SDU_SCTIME along with the selected sample rate are displayed in the Selected Parameters field.	
109.	Select **'CDH_CR_C_ERA_SBRY_1'** in the Selected Parameters field. Click the 'Remove' button.	CDH_CR_C_ERA_SBRY_1 is removed form the Selected Parameters field.	
110.	Click the 'OK' button.	Telemetry points and associated sample rates selected match the Selected Telemetry table in the Analysis Request window.	
111.	Save the analysis request. Click on the File pull down menu.	A list of options appears. These options include new, open, save, save as, delete, and quit.	
112.	Select 'Save as…'.	A File Selection window is displayed with a default directory path in the selection field. The default directory path will be /fosb/test/am1/data/FUI/requests/.	

113.	Enter the name of the request: **Myrequest1** Click the 'OK' button.	An error message is displayed indicating that the time selection is missing from the request.	
114.	Click the 'Close' button in the error dialog box.	The error dialog box will close.	
115.	**<u>Selecting Start and Stop Times</u>** Click on the 'Select Time' button.	The Selected Pair Times window is displayed and it contains the following fields and user interfaces: Start and Stop Times Select Remove	
116.	Click the 'Select' button	The Pair Time Selector window is displayed and includes the following fields and user interface menus: Type of pair time (Absolute or Relative) Start/stop key (Time or Event) Specify selection (End Time, End Event, or Duration)	
117.	Click the 'Absolute' button.	The 'Absolute' button is selected.	
118.	Click the 'Time' button.	The 'Time' button is selected.	
119.	Click the 'Specify End Time' button.	The 'Specify End Time' button is selected.	
120.	Enter into the stop time field: **15:32:53.000**	15:32:53.000 is displayed in stop time field.	

121.	Enter into the start time field: **15:00:03.000**	15:00:03.000 is displayed in start time field.	
122.	Enter into the start date field: **1997/217**	1997/217 is displayed in start date field.	
123.	Enter into the stop date field: **1997/217**	1997/217 is displayed in stop date field.	
124.	Click the 'OK' button.	The selected start and stop times match the start and stop times in the Selected Pair Times window.	
125.	Click the 'Remove' button	A dialog box will appear stating: Select a pair time to be removed first.	
126.	Click the 'Close' button.	The Dialog box will close.	
127.	High light time span to be removed Click the 'Remove' button.	The selected time span will disappear.	
128.	Click the 'Select' button	The Pair Time Selector window is displayed.	
129.	Enter into the stop time field: **18:09:11.000**	18:09:11.000 is displayed in stop time field.	
130.	Enter into the start time field: **18:04:22.000**	18:04:22.000 is displayed in start time field.	
131.	Enter into the start date field: **1997/234**	1997/234 is displayed in start date field.	

132.	Enter into the stop date field: **1997/234**	1997/234 is displayed in stop date field.	
133.	Click the 'OK' button.	The Selected Pair Times window is displayed.	
134.	Click the 'OK' button.	The selected start and stop times match the Selected Times table in the Analysis Request window.	
135.	Select an output dataset name for the analysis request. Click the output dataset name toggle button. Enter the name of the output dataset (request name): **Myrequest1**	Myrequest1 will be displayed in the Output Dataset Name box.	
136.	Click the CarryOut File Name toggle button.	This will generate a carry out file with the same names as the Analysis Request.	
137.	**<u>Save the analysis request</u>** Click on the File pull down menu.	A list of options appears.	
138.	Select 'Save as…'.	A File Selection window is displayed with a default directory path in the selection field. The default directory path will be /fosb/test/am1/data/FUI/requests/.	

139.	Enter the name of the request: **Myrequest1** Click the 'OK' button.	A dialog box informing the user that the file was saved.	
140.	Click the 'Close' button in the information dialog box.	The dialog box will close.	
141.	Click the 'OK' button in the Analysis Request Builder window.	A dataset for the given options selected has been submitted for generated.	
142.	Monitor the time the Event Display received the message Analysis Request **X** has started on Host **N**. Monitor the time the Event Display received the message Analysis Request **X** is completed on Host **N**. Where X = the number of the request and N = the Name of the Host machine that started the request.	Wait for an event message indicating that the analysis request is complete. In the Events Display window, a message will be displayed 'Analysis Request **X** completed on Host **N**.' The Analysis request should process at 12 times the real-time rate. The analysis will be done post test.	
143.	**Verify the analysis request was saved**. Invoke the Analysis Request Builder Click on the 'Tools' button.	The Tools Dialog window and a list of tools is displayed to the user.	
144.	Select 'Analysis_Request_Builder'. Click on 'OK' button.	The Analysis Request Builder window is displayed.	
145.	Click the File pull down menu.	A list of options appears.	
146.	Select 'Open'.	The File Selection window is displayed.	

147.	Select '**Myrequest1**'. Click the 'OK' button.	An Analysis Request Information dialog box will appear stating: This request was already sent… Modifying or resending this request will not be permitted.	
148.	Click the 'Close' button in the dialog box.	A request is displayed and that it matches the previously saved request.	
149.	Check the Request Status text area in the Analysis Request Builder window.	The Request Status will indicate Submitted.	
150.	Click the 'Cancel' button.	The Analysis Request Builder window will close.	
151.	**Edit an Analysis Request.** Invoke the Analysis Request Builder Click on the 'Tools' button.	The Tools Dialog window and a list of tools is displayed to the user.	
152.	Select 'Analysis_Request_Builder'. Click on 'OK' button.	The Analysis Request Builder window is displayed.	
153.	Click the File pull down menu.	A list of options appears.	
154.	Select 'Open'.	The File Selection window is displayed.	
155.	Select '**Template**'. Click the 'OK' button.	The Analysis Request named Template is displayed.	
156.	Check the Request Status text area in the Analysis Request Builder window.	The Request Status will indicate Read/Edit Request.	

157.	**Selecting Start and Stop Times** Click on the 'Select Time' button.	The Selected Pair Times window is displayed.	
158.	Click the 'Select' button	The Pair Time Selector window is displayed.	
159.	Click the 'Absolute' button.	The 'Absolute' button is selected.	
160.	Click the 'Time' button.	The 'Time' button is selected.	
161.	Click the 'Specify End Time' button.	The 'Specify End Time' button is selected.	
162.	Enter into the stop time field: **18:09:11.000**	18:09:11.000 is displayed in stop time field.	
163.	Enter into the start time field: **18:04:22.000**	18:04:22.000 is displayed in start time field.	
164.	Enter into the start date field: **1997/234**	1997/234 is displayed in start date field.	
165.	Enter into the stop date field: **1997/234**	1997/234 is displayed in stop date field.	
166.	Click the 'OK' button.	The Selected Pair Times window is displayed.	
167.	Click the 'OK' button.	The selected start and stop times match the Selected Times table in the Analysis Request window.	
168.	**Edit Template** with a negative sample rate. Click the 'Select Telemetry…' button.	The Telemetry Selector window is displayed.	

169.	Enter into the sample rate text field: **-1** Click the 'Select' button.	An error message is displayed to indicate an illegal sample rate.	
170.	Click the 'Close' button in the error dialog box.	The error dialog box will close.	
171.	Invoke the Selection Filter Screen: Click on the 'Filter…' button.	The Selection Filter Screen is displayed.	
172.	Select '**AM1**' in the Spacecraft text area.	Instruments associated with AM1 are displayed in the Instrument text area.	
173.	Select '**CDH**' in the Instrument text area.	Sample Types associated with CDH are displayed in the Sample Type text area	
174.	Select '**B**' in the sample type text area. Click on the 'Select' button.	The subsystem mnemonic AM1_CDH_B is displayed in the Selected text area.	
175.	Click the 'OK' button.	The filter list is displayed in the Analysis Telemetry Selector window in the Subsystems section.	
176.	Click on the '**AM1_CDH_B**' toggle button in the subsystems text area.	A list of mnemonics associated AM1_CDH_B with are displayed in the Available Parameters text area of the Analysis Telemetry Selector window.	
177.	In the Find text field enter: **'CDH_BR_PWDP_CH3'** Click on 'Select' button	An error dialog box will display a message indicating that this is an invalid mnemonic.	

178.	Click 'Close' in the error dialog box.	The dialog box will close.	
179.	Click the 'Cancel' button.	The Telemetry Selector window will close.	
180.	**Change the analysis request and resubmit it.** Click the 'Local Only' button.	The 'Local Only' button will be selected.	
181.	Select an output dataset name for the analysis request. Click the output dataset name toggle button. Enter the name of the output dataset (request name): **Modlocal**	Modlocal will be displayed in the Output Dataset Name box.	
182.	Insure the CarryOut File Name toggle button is selected.	This will generate a carry out file with the same names as the Analysis Request.	
183.	**Save the analysis request** Save the analysis request. Click on the File pull down menu.	A list of options appears.	
184.	Select 'Save as…'.	A File Selection window is displayed with a default directory path in the selection field. The default directory path will be /fosb/test/am1/data/FUI/requests/.	
185.	Enter the name of the request: **Modlocal** Click the 'OK' button.	A dialog box informing the user that the file was saved.	

186.	Click the 'Close' button in the information dialog box.	The dialog box will close.	
187.	Click the 'OK' button.	The Analysis Request has been resubmitted.	
188.	Monitor the time the Event Display received the message Analysis Request **X** has started on Host **N**. Where X = the number of the request and N = the Name of the Host machine that started the request.	Wait for an event message indicating that the analysis request is complete. In the Events Display window, a message will be displayed 'Analysis Request **X** completed on Host **N**.'	
189.	**Verify the analysis request was saved**. Invoke the Analysis Request Builder Click on the 'Tools' button.	The Tools Dialog window and a list of tools is displayed to the user.	
190.	Select 'Analysis_Request_Builder'. Click on 'OK' button.	The Analysis Request Builder window is displayed.	
191.	Click the File pull down menu.	A list of options appears.	
192.	Select 'Open'.	The File Selection window is displayed.	
193.	Select '**Modlocal**'. Click the 'OK' button.	An Analysis Request Information dialog box will appear stating: This request was already sent… Modifying or resending this request will not be permitted.	
194.	Check the Request Status text area in the Analysis Request Builder window.	The Request Status will indicate Submitted.	

195.	Click the 'Cancel' button.	The Analysis Request Builder window will close.	
196.	**Delete an Analysis Request**. Invoke the Analysis Request Builder Click on the 'Tools' button.	The Tools Dialog window and a list of tools is displayed to the user.	
197.	Select 'Analysis_Request_Builder'. Click on 'OK' button.	The Analysis Request Builder window is displayed.	
198.	Click the File pull down menu.	A list of options appears.	
199.	Select 'Delete'.	The File Selection window is displayed.	
200.	Select '**Modlocal**'. Click the 'OK' button.	A dialog box is displayed prompting for verifying that the request be deleted.	
201.	Click the 'yes' button.	The dialog box will close.	
202.	Verify that the request is deleted. Click on the File pull down menu.	A list of options appears.	
203.	Select 'Open'.	The File Selection window is displayed. Modlocal does not appear in the list of saved files.	
204.	Select 'Cancel' from the file selection window.	The File Selection Window closes.	
205.	Click the 'Cancel' button in the Analysis Request Builder window.	The Analysis Request Builder window closes.	

206.	**Verify that a dataset was created** Enter the following in a terminal window: %:**cd /fosb/test/am1/datasets** %:**ls -la**	A long listing of the contents of the directory datasets is displayed containing files named Myrequest1.meta, Myrequest1.data, and Modlocal.data, Modlocal.meta.	
207.	Enter the following in a terminal window: %:**cd /fosb/test/am1/data** %:**ls -la**	A long listing of the contents of the directory data is displayed containing files named Myrequest1.out and Modlocal.out.	
208.	At the Unix prompt enter: %:**lp Myrequest1.out** %:**lp Modlocal.out**	This will print the carryout file.	

209.	Via off - line analysis →	Verify that each dataset contains the following information:	
		-raw value	
		-EU converted value (if applicable)	
		-quality status indicator	
		-out of limits indicator (both high and low)	
		-delta limit error indicator	
		-conversion error indicator	
		-invalid mnemonic indicator	
		The number of samples listed for each parameter matches the number of available selections in the time frame.	
		Each mnemonic contains a spacecraft time for each occurrence.	
		The time tag includes year, day, hour, minute, second, and millisecond.	
		The dataset is within the start and stop times selected by the user.	
		All data received is used in the analysis whether good or bad quality.	
		Verify in Modlocal carry out file that the mnemonic CDH_BR_PWDP_CH3 is not in the dataset.	
210.	End of test.		